SHARP® SERVICE MANUAL

S40193R84SEHW

MICROWAVE OVEN WITH GRILL AND CONVECTION

MODEL R-84ST

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

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SHARP CORPORATION

WARNING

CAUTION
MICROWAVE RADIATION

Personnel should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected.
All input and output microwave connections, waveguides, flanges and gaskets must be secured.
Never operate the device without a microwave energy absorbing load attached.
Never look into an open waveguide or antenna while the device is energized.

VARNING
MICKROVAGSSTRALING

Personal får inte utsättas för mikrovågsenergi som kan ustrala från magnetronen eller andre mikrovågsalstrande anordningar om dessa är felanslutna eller används på fel sätt.
Alla in-och utgångsanslutningar för mikrovågor, vagledare, flänsar och packningar måste vara fast anslutna.
Mikrovågsgeneratorn får inte arbeta utan att absorberande belastning är ansluten. Titta aldrig in i ën öppen vågledare eller antenn när mikrovågsgeneratorn är påkopplad eller laddad.

VAROITUS
MIKROAALTOSÄTELYÄ

Käyttäjä ei saa joutua alttiiksi mikroaaltoenergialle, jota voi säteillä magnetronista tai muusta mikroaaltoja kehittävästä laitteesta, jos sitä käytetään tai jos se kytketään väärin.
Kaikkien mikroaaltoliitäntöjen sekä syöttö-että ulostulopuolella, aaltoputkien laippojen ja tiivisteiden tulee olla varmistettuja.
Mikroaaltouunnia ei koskaan saa käyttää ilman kuormaa jossa mikroaaltoenergiaa kuluu.
Avoimeen aaltoputkeen tai antenniin ei koskaan saa katsoa virran ollessa kytkettynä.

ADVARSEL
MIKROBØLGESTRÅLING

Personell må ikke utsettes for mikrobølge-energi som kan utståles fra magnetronen eller andre mikrobølge-generende deler dersom apparatet feilbetjenes eller blir feiltikoplet.
Alle inn-og ut-tilkoplinger i forbindelse med mikrobølge-strålingen, bølgeledere, flenser og tetningsringer/pakninger må festes ordentlig.
Aldri bruk apparatet med mindre en mikrobålge-absorberende last er plassert i ovnsrommet.
Aldri se direkte inn i en åpen bølgeleder eller antenne imens apparatet er strømførende.

ADVARSEL
MIKROBØLGEBESTRÄLING

Man bør ikke udsætte sig for mikrobølgebestråling fra magnetronen eller andre mikrobølgefrembringende anordninger, hvilket kan ske hvis apparatet er forkert tilsluttet eller bruges forkert. Alle mikrobølgeindgange og-udgange, bølgeledere, flanger og tætningsstrimler må være forsvarligt udført.
Anvend aldrig ovnen uden en mikrobølgesabsorberende anordning. Se aldrig ind i en åben bølgeleder eller antenne, mens ovnen er i brug.

SERVICE MANUAL

SHARP

GRILL AND CONVECTION MICROWAVE OVEN

R84ST

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

CAUTION
MICROWAVE RADIATION
DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS THAT CONDUCT MICROWAVE ENERGY.

WARNING

Note:	The parts marked "*" are used in voltage more than 250V. (Parts List)
Anm:	Delar märket med "*" har en spänning överstigande 250V.
Huom:	Huolto-ohjeeseen merkitty "tähdella" osat joissa jännite on yli 250 V.
Bemerk:	Deler som er merket "asterisk" er utsatt for spenninger over 250V til jord.
Bemærk:	"Dele mærket med stjerne benyttes med højere spænding end 250 volt.

WARNING

Never operate the oven until the following points are ensured.
(A) The door is tightly closed.
(B) The door brackets and hinges are not defective.
(C) The door packing is not damaged.
(D) The door is not deformed or warped.
(E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained Service Engineers.

All the parts marked ”*” on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

All the parts marked "Δ" on the parts list may cause undue microwave exposure, by themselves, or when they are damaged loosened or removed.

SERVICING

WARNING TO SERVICE PERSONNEL

(GB) Microwave ovens contain circuitry capable of producing very high voltage and current.
Contact with the following parts will result in electrocution
High voltage capacitor, High Voltage transformer, Magnetron, High voltage rectifier assembly, High voltage wires.

REMEMBER TO CHECK 3D

1) Disconnect the supply.
2) Door opened, and wedged open.
3) Discharge high voltage capacitor.

WARNING AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR
The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the power transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the power transformer.

REMEMBER TO CHECK 4R

1) Reconnect all leads removed from components during testing.
2) Replace the outer case (cabinet).
3) Reconnect the supply.
4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power to HIGH and set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test carried out.

(NL) Magnetronovens bevatten circuits die een zeer hoge spanning en stroom kunnen voortbrengen. Contact met de volgende onderdelen kan elektrocutie tot gevolg hebben.
Hoogspanningscondensator, hoogspanningstransformator, magnetron, hoogspanningsgelijkrichter, hoogspannings draden.

VERGEET DE VOLGENDE 3 STAPPEN NIET

1) Haal de stekker uit het stopcontact.
2) Open de deur en zorg ervoor dat hij niet dicht kan vallen.
3) Ontlaad de hoogspanningscondensator.

PAS OP VOOR DE ELECTRISCHE LADING VAN DE HOOGSPANNINGSCONDENSATOR
De hoogspanningscondensator blijft nog ongeveer 60 seconden lang opgeladen, nadat de oven is uitgeschakeld. Wacht 60 seconden voordat u de verbinding van de hoogspannings-condensator (m.a.w. de verbindingsdraad van de hoogspanningsgelijkrichter) met een geïsoleerde schroevedraaier kortsluit tegen het chassis.

Sharp beveelt ten sterkste aan dat, voor zover mogelijk, defecten worden opgespoord wanneer de stekker uit het stopcontact is gehaald. Soms is het nodig om de stroomtoevoer weer tot stand te brengen nadat de buitenmantel verwijderd is. Herhaal dan de bovengenoemde 3 stappen en haal de electrische draden uit de primaire zijde van de vermogenstransformator. Zorg ervoor dat deze draden geïsoleerd blijven van andere elementen en van het chassis van de oven. (Gebruik zo nodig isolatieband.) Wanneer de test is uitgevoerd, herhaalt u de bovenstaande 3 stappen en verbindt u de electrische draden weer aan de primaire zijde van de vermogenstransformator.

VERGEET DE VOLGENDE 4 STAPPEN NIET

1) Sluit de draden weer aan diezijn losgehaald voor de test.
2) Plaats de buitenmantel weer om het toestel heen (kabinet).
3) Stop de stekker weer in het stopcontact.
4) Zet de oven aan. Controleer alle functies.

Magnetronovens mogen niet leeg aangezet worden. Om te controleren of er microgolf-energie binnen de oven wordt geproduceerd, plaatst u een mok met koud water op de draaitafel van de oven, sluit de deur, zet de oven op HIGH en stelt de klok van de magnetron in op twee (2) minuten. Wanneer de twee minuten voorbij zijn (klok staat op nul), controleert u voorzichtig of het water heet is. Indien het water nog steeds koud is, herhaalt u de allereerste drie stappen en controleer nogmaals de aansluitingen naar de geteste onderdelen.

Wanneer alle reparaties zijn uitgevoerd en de oven weer in elkaar is gezet, moet de het magnetronvermogen worden gecontroleerd en moet worden gecontroleerd of er geen microgolflekkage is.

SERVICING

(E) Los hornos de microonda contienen el trazado de circuito capaz de producir muy de alto voltaje y actual El contacto con las piezas siguientes dará lugar a electrocutio. Para evitar elriesgo de electrocución, absténgase de tocar los siguientes componentes:Condensador de alto voltaje, tranformer de alto voltaje, magnetrón, ensamblaje de rectificador de alto voltaje, alambres de alto voltaje.

RECUERDE LA COMPROBACION 3D

1) Desconecte la alimentación.
2) Deje la puerta abierta y calzada.
3) Descargue el condensador de alto voltaje.

ADVERTENCIA SOBRE LA CARGA DEL CONDENSADOR DE ALTO VOLTAJE
El condensador de alto voltaje permanece cargado unos 60 segundos después de haber apagado el horno. Espere 60 segundos y luego ponga en cortocircuito la conexión del condensador de alto voltaje (esto es, del conductor de conexión del rectificador de alto voltaje) al chasis con un destornillador de mango aislado.

Se recomienda encarecidamente que siempre que sea posible la localización de fallos se realice con la alimentación desconectada. Puede ser que en algunos casos sea necesario conectar la alimentación después de haber retirado la carcasa exterior. En este caso, realice las comprobaciones 3D y luego desconecte los conductores del primario del transformador de alimentación. Asegúrese de que estos conductores permanezcan aislados de otros componentes y del chasis del horno. (Use cinta aislante si es necesario). Cuando termine la prueba efectúe las comprobaciones 3D y reconecte los conductores al primario del transformador de alimentación.

RECUERDE LA COMPROBACION 4C

1) Conecte todos los componentes desconectados de los componentes durante la prueba.
2) Coloque la carcasa exterior (cabina).
3) Conecte la alimentación.
4) Compruebe todas sus funciones despues de poner en marcha el horno.

Los hornos de microondas no deben funcionar vacíos. Para comprobar la presencia de energía de microondas dentro de una cavidad, coloque una taza de agua fría en el plato giratorio del horno, cierre la puerta y ponga la potencia en HIGH (alta) y coloque el temporizador en dos (2) minutos. Cuando transcurran los dos minutos (temporizador a cero) compruebe cuidadosamente que el agua se ha calentado. Si el agua permaneciese fría, efectúe las comprobaciones 3D y vuelva a examinar las conexiones de los componentes que han sido probados.

Cuando haya terminado la intervención en el equipo y el horno haya sido ensamblado de nuevo completamente, deberá comprobar la potencia de salida de microondas y realizar una prueba de fugas de microondas.

(SV) Mikrovågsugnar ugnarna innehålla kretskippet duglig om producerande mycket hög spänningen och gångbar. Konktakten med det följande delen vill resultera inne dödsfall:
Hög spänningen kondensator, hög spänningen transformator, magnetron, hög spänningen likriktare, hög spänningen tråden.

KOM IHÅG ATT KONTROLLERA 3 STEG

1) Koppla från strömkällan.
2) Öppna dörren på glänt.
3) Ladda ur högspänningskondensatorn.

VARNING FÖR LADDNINGEN I HÖGSPÄNNINGSKONDENSATORN
Högspänningskondensatorn är laddad i 60 sekunder efter det att ugnen stängts av. Vänta 60 sekunder och korislut sedan kondensatoms anslutning (dvs anslutningen till högspänningslikriktaren) till chassiet med hjälp av en isolerad skruvmejsel.

Sharp rekommenderar att felsökning sker med strömmen fränkopplad. Ibland kan det var nödvändigt att koppla på strömmen efter det att höljet avlägsnats, utför da 3 Steg kontrollen och koppla sedan från ledarna till transformatorns primärsida. Se till att ledarna är isolerade från andra komponenter och chassiet. (Använd isoleringsband om det behövs). När Du testat färdigt utför Du 3 Steg kontrollen och ansluter ledningarna till transformatorns primärsida igen.

KOM IHÅG ATT KONTROLLERA 4 STEG

1) Anslut alla ledningar som använts vid testning
2) Sätt tillbaka ytterhöljet.
3) Anslut strömkällan på nytt.
4) Sätt på ugnen. Kontrollera alla funktioner.

Mikrovågsugnar får inte användas tomma. Kontrollera mikrovågsstrålningen i olika delar av ugnen genom att placera en kopp med kallt vatten på ugnens tallrik, stäng dörren, ställ in HIGH och ställ in 2 minuter på timern. När två minuter har gått (timem visar 0) kontrollerar du om vattnet är varmt. Om vattnet fortfarande är kallt utför Du 3 steg kontroller och kontrollerar anslutningarna till varje enskild komponent på nytt.

När all service är klar och ugnen ihopskruvad skall ugnens uteffekt och eventuellt mikrovågsläckage kontrolleras.

SERVICING

I forni a microonde contengono i circuiti capaci di produrre molto ad alta tensione e corrente Il contatto con le seguenti parti provocherà electrocution.

Condensatore ad alta tensione, tranformer ad alta tensione, magnetron, complessivo di raddrizzatore ad alta tensione, legare ad alta tensione.

TRE OPERAZIONI IMPORTANTI PER INCOMINCIARE

1) Scollegare l'alimentazione elettrica.
2) Verificare che la porta sia bloccata in posizione aperta.
3) Scaricare il condensatore ad alta tensione.

ATTENZIONE AL CONDENSATORE AD ALTA TENSIONE: PUO ESSERE CARICO
Il condensatore ad alta tensione rimane carico per circa 60 secondi dopo lo spegnimento del forno. Occorre quindi spettare 60 secondi prima di cortocircuitare, utilizzando un cacciavite con impugnatura isolata, il collegamento del condensatore ad alta tensione (cioè del conduttore di collegamento del raddrizzatore ad alta tensione) sul telaio del forno.

Sharp raccomanda, nei limiti del possibile, che la ricerca dei guasti avvenga in assenza di alimentazione elettrica. In alcuni casi tuttavia, può essere necessario alimentare l'apparecchio dopo aver rimosso la scatola esterna. In questo caso eseguire i tre controlli sopra citati e quindi scollegare i connettori dal primario del trasformatore. Assicurarsi che tali connettori non vengano a contatto con altri componenti, ne con il telaio del forno (fare uso, se necessario, di nastro isolante). Al termine dell'intervento, eseguire nuovamente i tre controlli e ricollegare i conduttori al primario del trasformatore.

QUATTRO VERIFICHE IMPORTANTI DA NON DIMENTICARE

1) Ricollegare tutti i conduttori staccati dai vari componenti durante l'intervento.
2) Rimontare la scatola esterna.
3) Ripristinare l'alimentazione elettrica.
4) Rimettere in funzione il forno. Controllare tutte le funzioni.

I forni a microonde non devono mai funzionare a vuoto. Per verificare la presenza di energia da microonde all'interno di una cavitá, mettere una tazza di acqua fredda sul piatto rotante del forno, chiudere la porta, regolare la potenza su HIGH ed impostate il temporizzatore su due (2) minuti. Trascorsi i due minuti (temporizzatore a zero), controllare accuratamente che ora l'acqua sia calda. Se l'acqua è rimasta fredda, eseguire i tre controlli iniziali e verificare nuovamente i collegamenti del componente in questione.

Dopo aver portato a termine le operazioni di manutenzione e rimontato il forno, è necessario controllare la potenza delle microonde emesse ed eseguire un test per verificare che non vi sia alcuna dispersione.

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse F8A in the monitored latch switch - monitor switch circuit, check the monitored latch switch and monitor switch before replacing the fuse F8A.

CAUTION/WARNING

CAUTION
MICROWAVE RADIATION

Service engineers should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

WARNING

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked "*" on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

All the parts marked "Δ" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

WARNING

THIS APPLIANCE MUST BE EARTHED. THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW : EARTH BLUE : NEUTRAL BROWN : LIVE

PRODUCT DESCRIPTION

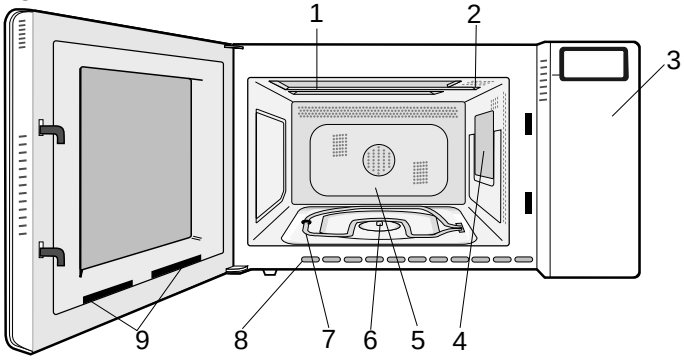
SPECIFICATION

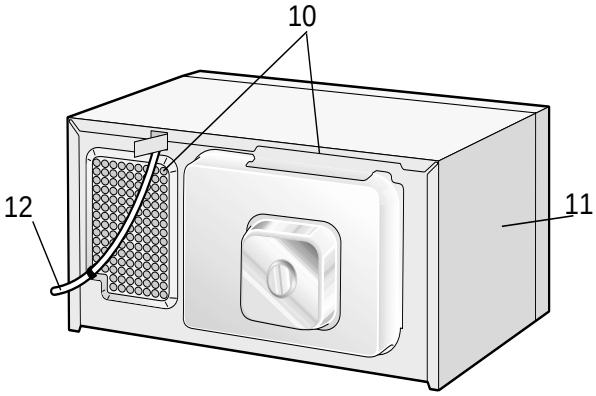
ITEM	DESCRIPTION
Power Requirements	230 Volts / 50 Hertz / Single phase, 3 wire earthed
Power Consumption	Microwave cooking 1.45kW Approx. 6.5A
	Dual cooking (Microwave and Top Grill) 2.4kW Approx. 10.5A (Microwave and Bottom Grill) 1.95kW Approx. 8.5A (Top and Bottom Grill) 1.5kW Approx. 6.5A (Triple Function) 2.9kW Approx. 13A
	Convection cooking 1.525kW Approx. 6.6A
	Bottom Grill cooking 550kW Approx. 2.4A
	Top Grill cooking 1.0kW Approx. 4.4A
Power Output	900 watts nominal of RF microwave energy (measured by method of IEC 60705) Operating fequency 2450 MHz
Top Grill heating element Power Output	950W
Bottom Grill heating element Power Output	500W
Case Dimensions	Width 520 mm Height 309 mm (including foot) Depth 488 mm
Cooking Cavity Dimensions	Width 349 mm Height 207 mm Depth 357 mm
Turntable diameter	325mm
Control Complement	Touch Control System Microwave Cooking Control Repetition Rate; HIGH ..... Full power throughout the cooking time MEDIUM HIGH ..... approx. 70% of FULL Power MEDIUM ..... approx. 50% of FULL Power MEDIUM LOW ..... approx. 30% of FULL Power LOW ..... approx. 10% of FULL Power FRESH PIZZA/FRESH QUICHE keys BOILED/JACKET POTATOES keys INSTANT ACTION keys MORE(▲) / LESS(▼) keys TIME keys CONVECTION key DUAL MODE key +1 MIN/START button DOOR OPEN button STOP key GRILL MODE key MICROWAVE POWER LEVEL key CLOCK SETTING key CLOCK SETTING key FRENCH FRIED POTATOE key FROZEN PIZZA/FROZEN QUICHE key
Net Weight	Approx. 20 kg

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice

APPEARANCE VIEW

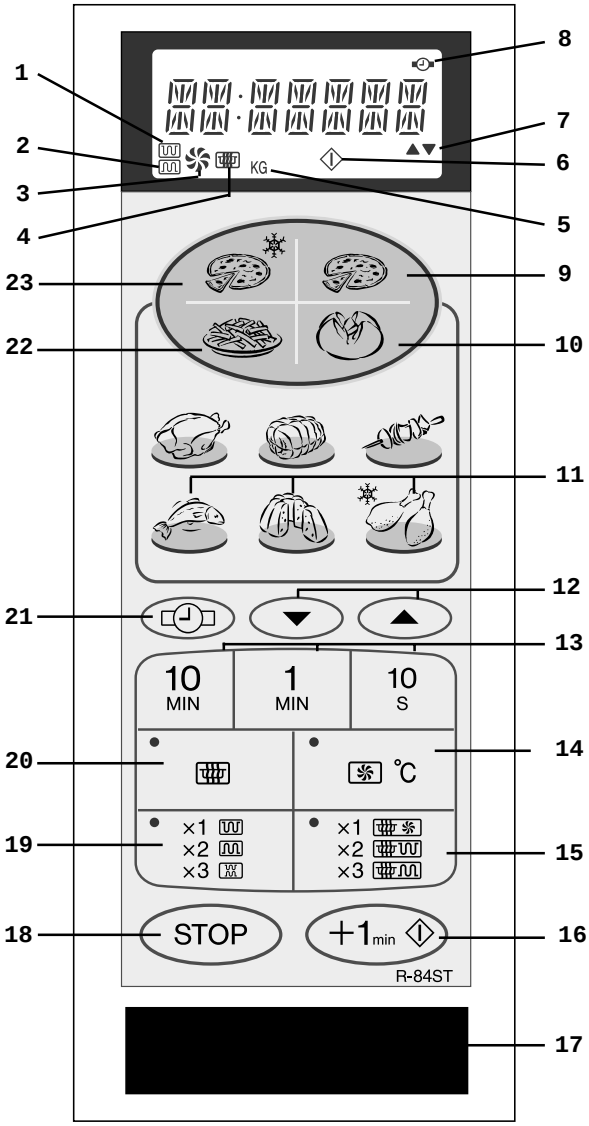
OVEN





1. Grill heating element (top grill)
2. Oven lamp
3. Control panel
4. Waveguide cover
5. Oven cavity
6. Turntable motor shaft
7. Grill heating element (bottom grill)
8. Air-vent openings
9. Door seals
10. Air vent openings
11. Outer cabinet
12. Power cord

CONTROL PANEL



Digital display and indicators:

1 TOP GRILL indicator
2 BOTTOM GRILL indicator
3 CONVECTION indicator
4 MICROWAVE indicator
5 WEIGHT indicator
6 COOKING IN PROGRESS indicator
7 LESS/MOREindicator
8 CLOCK SETindicator

Operating buttons:

9 FRESH PIZZA/FRESH QUICHE key
10 BOILED/JACKET POTATOES key
11 INSTANT ACTION keys
12 LESS/MORE buttons
13 TIME keys
14 CONVECTION key
Press to change the convection setting
15 DUAL MODE key:
1 PRESS = MICROWAVE & CONVECTION
2 PRESSES = MICROWAVE & TOP GRILL
3 PRESSES = MICROWAVE & BOTTOM GRILL
16 +1 MIN/ START button
17 DOOR OPEN button
18 STOP key
19 GRILL MODE key:
1 PRESS = TOP GRILL
2 PRESSES = BOTTOM GRILL
3 PRESSES = TOP & BOTTOM GRILL
20 MICROWAVE POWER LEVEL key
Press to change the microwave power setting
21 CLOCK SETTING key
22 FRENCH FRIED POTATO key
23 FROZEN PIZZA/FROZEN QUICHE key

OPERATION SEQUENCE

OFF CONDITION

Closing the oven door activates all door interlock switches (Monitored latch switch and stop switch.

IMPORTANT:
When the oven door is closed, the contacts COM-NC of the monitor switch SW2 must be open and the contacts (COM-NO) must be closed. When the microwave oven is plugged in a wall outlet (230V / 50Hz), 230 volts A.C. is supplied to the point A1 + A3 in the control unit.

Figure O-1 on page 34

1. The display flashes "88:88"
2. To set any programmes or set the clock, you must first touch the STOP key.
3. " : " appears in display.

NOTE: When the oven door is opened, the oven lamp comes on at this time.

MICROWAVE COOKING CONDITION

HIGH COOKING

Enter a desired cooking time with the Time keys and start the oven by touching the START key.

Function sequence Figure O-2 on page 34

CONNECTED COMPONENTS	RELAY
Oven lamp, Turntable motor	RY1
High voltage transformer	RY2
Fan motor	RY6

1. 230 volts A.C. is supplied to the primary winding of the high voltage transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a signal tone is heard and the relays RY1 + RY2 + RY6 go back to their home position. The circuits to the oven lamp, high voltage transformer, fan motor and turntable motor are cut off.
5. When the oven door is opened during a cooking cycle, the switches come to the following condition.

Switch	Contact	Condition	
		During Cooking	Oven Door Open(No cooking)
Monitored latch Switch	COM-NO	Closed	Opened
Monitored latch Switch	COM-NC	Opened	Closed
Monitor Switch	COM-NO	Closed	Opened
Monitor Switch	COM-NC	Opened	Closed
Stop switch	COM-NO	Closed	Opened

The circuit to the high voltage transformer, is cut off when the contact of relay RY2 contacts COM-NO of the monitored latch switch, and monitor switch SW2 are made open. The circuit to the fan motor is cut off when the relay RY6 is made open. The circuit to the turntable motor is cut off when the contacts COM-NO of the monitored latch switch are made open. The relays RY2 and RY5 are made open when the door is opened. The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay RY1 stay closed.

Shown in the display is remaining time.

6. MONITOR SWITCH CIRCUIT
   The monitor switch SW2 is mechanically controlled by the oven door, and monitors the operation of the monitored latch switch SW1.

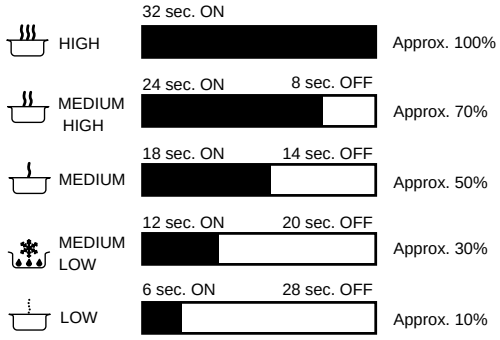
6-1. When the oven door is opened during or after the cycle of a cooking program, the monitored latch switch SW1 and stop switch SW3 must open their contacts (COM-NO) first. After that the contacts (COM-NC) of the monitor switch SW2 can be closed and the contacts (COM-NO) of monitor switch SW2 are made open.

6-2. When the oven door is closed. The contacts (COM-NC) of the monitor switch SW2 must be opened and the contacts (COM-NO) of monitor switch SW2 must be closed. After that the contacts of the monitored latch switch SW1 and the stop switch SW3 are made closed.

6-3. When the oven door is opened and the contacts of the monitored latch switch SW1 remain closed, the fuse F2 F8A will blow. Because the relay RY1 and monitor switch SW2 are closed and a short circuit is caused.

MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, the 230 volts A.C. power is supplied to the high voltage transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay RY2. The following levels of microwave power are given.



Note: The On/Off time ratio does not exactly correspond to the percentage of microwave power, because approx. 3 seconds are needed for heating up the magnetron filament.

CONVECTION COOKING CONDITION

PREHEATING CONDITION (Figure O-4)

Program desired convection temperature by touching CONVECTION key. When the START key is touched, the following operations occur:

1. The coil of shut-off relays RY1, RY6 and RY7 are energized, the oven lamp, cooling fan motor, turntable motor and convection motor are turned on.
2. The coil of shut-off relays RY3 and RY4 are energized by the control unit and the main supply voltage is added to the top and bottom heater.
3. When the oven temperature reaches the selected preheat temperature, the following operations occur;

3-1. The shut-off relays RY3 and RY4 are de-energized by the control unit temperature circuit and thermistor, opening the circuit to the top and bottom heating elements.

3-2. The oven will continue to function for 30 minutes, turning the convection heating elements on and off, as needed to maintain the selected preheat temperature. The oven will shut-down completely after 30 minutes.

OPERATION SEQUENCE

CONVECTION COOKING CONDITION (Figure O-4)

When the preheat temperature is reached, a beep signal will sound indicating that the holding temperature has been reached in the oven cavity. Open the door and place the food to be cooked in the oven. Program desired cooking time and convection temperature by touching the ˚C key, and using the 'TIME keys' to set the time. When the START key is touched, the following operations occur:

1. The numbers of the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor, turntable motor and convection motor are energized.
3. Relays RY3 and RY4 are energized (if the cavity temperature is lower than the selected temperature) and the main supply voltage is applied to the top and bottom heaters to return to the selected cooking temperature.
4. Upon completion of the cooking time, the audible signal will sound, and oven lamp, turntable motor, cooling fan motor and convection motor are de-energized. At the end of convection cycle, if the cavity air temperature is above 104˚C, the circuit to RY6 will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor until temperature drops below 104˚C, at that time the relay will be de-energized, turning off the fan motor .

GRILL COOKING CONDITION
TOP GRILL (Figure O-3a)

In this condition the food is cooked by grill heating element energy. Programme the desired cooking time and top grill mode by pressing the 'GRILL MODE' key once, and the 'TIME' keys to set the time. When the START key is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.
3. The relay RY3 is energized and the main supply voltage is applied to the top grill heater.
4. Now the food is cooked by the top grill heater.

GRILL COOKING CONDITION
BOTTOM GRILL (Figure O-3b)

In this condition the food is cooked by bottom grill heating element energy. Program the desired cooking time and bottom grill mode by pressing the 'GRILL MODE' key twice, and the'TIME' keys to set the time. When the START key is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.
3. The relay RY4 is energized and the main supply voltage is applied to the bottom grill heater.
4. Now the food is cooked by the bottom grill heater.

GRILL COOKING CONDITION
TOP AND BOTTOM GRILL (Figure O-3c)

In this condition the food is cooked by the top and bottom grill heating element energy. Program the desired cooking time and top+bottom grill mode by pressing the 'GRILL MODE' key 3 times, and the 'TIME' keys to set the time . When the START key is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.
3. The relay RY4 is energized and the main supply voltage is applied to the bottom grill heater.
4. The relay RY3 is energized and the main supply voltage is applied to the top grill heater.
5. Now the food is cooked by the bottom grill heater.

DUAL COOKING CONDITION
MICROWAVE AND CONVECTION (Figure O-5a)

Programme the desired cooking time by touching the TIME keys. Touch the DUAL key once. Select the microwave power level by touching the MICROWAVE POWER LEVEL key. And select the convection temperature by touching the CONVECTION key.

NOTE: The microwave power level can be selected from 90W, 270W and 450W.

When the STARTkey is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor, turntable motor and convection motor are energized.
3. The relay RY3 will be energized and the main supply voltage is applied to the top grill heatier.
4. The relay RY4 is energized (if the cavity temperature is lower than selected temperature) and the main supply voltage is applied to the bottom heating elementer.
5. The relay RY2 is energized and the microwave energy is generated by the magnetron.
6. Now, the food is cooked by microwave and convection energy simultaneously.

MICROWAVE AND TOP GRILL (Figure O-5b)

Programme the desired cooking time by touching the TIME keys. Touch the DUAL key twice. Select the microwave power level by touching the MICROWAVE POWER LEVEL key. When the STARTkey is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.
3. The relay RY3 is energized and the main supply voltage is applied to the top grill heating element.
4. The relay RY2 is energized and the microwave energy is generated by the magnetron.
5. Now, the food is cooked by microwave and top grill simultaneously.

MICROWAVE AND BOTTOM GRILL (Figure O-5c)

Programme the desired cooking time by touching the TIME keys. Touch the DUAL three times. Select the microwave power level by touching the MICROWAVE POWER LEVEL key. When the STARTkey is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.
3. The relay RY4 is energized and the main supply voltage is applied to the bottom grill heating element.
4. The relay RY2 is energized and the microwave energy is generated by the magnetron.
5. Now, the food is cooked by microwave and bottom grill simultaneously.

FUNCTION OF IMPORTANT COMPONENTS

POWER SETTING

The power setting of the top heating element, bottom heating element and fan motor in the oven cooking mode and preheating mode is 100%.

ON/OFF TIME RATIO

In grill cooking, convection cooking or dual cooking, the top heater, bottom heater or magnetron operate whithin a 48 second time base. The following table is the ON / OFF time ratio at each power output of the top heaters, bottom heater or magnetron.

POWER OUTPUT	ON TIME	OFF TIME
100%	48 sec.	0 sec.
90%	44 sec.	4 sec.
80%	40 sec.	8 sec.
70%	36 sec.	12 sec.
60%	32 sec.	16 sec.
50%	26 sec.	22 sec.
40%	22 sec.	26 sec.
30%	16 sec.	32 sec.
20%	12 sec.	36 sec.
10%	8 sec.	40 sec.

AUTOMATIC COOKING

FRESH PIZZA/ FRESH QUICHE
FROZEN PIZZA/ FROZEN QUICHE
FRENCH FRIED POTATO
BOILED/ JACKET POTATOES
INSTANT ACTION

Above functions are automatic cooking. They automatically work out the correct cooking mode and cooking time and/or cooking temperature. They will cook according to the special cooking sequence.

LIMITATIONS OF POWER OUTPUT IN MANUAL OPERATION

After the same cooking mode is carried out for more than the specified cooking time, the power output is automatically reduced by turning the control relays on and off intermittently, as shown in the table below. This is to protect the oven door against temperature rising.

	Cooking mode	Specified cooking time (minutes)	Limited power output (%)	Time base (seconds)
	Microwave (100%)	20	70	32
	Top grill	30	50	48
	Bottom grill	45	50	48
	Top grill and	15 (Top)	50	48
	Bottom grill	15(Bottom)	50	48
DUAL	Micro. (100%)	20 (Micro.)	70	48
DUAL	+ Top grill	15 (Grill)	50	48
DUAL	Micro. (100%)	20 (Micro.)	70	48
DUAL	+ Bottom grill	15 (Heater)	50	48

NOTE:

1. In case of Automatic operations, the limitations of power output are not carried out.
2. If the stop key is touched or the oven door is opened during cooking, the limitations of power output are not carried out after the total cooking time beyond the specified cooking time.
3. In the case of two or more of the same cooking modes being carried out, the limitations of power output are not carried out after the total cooking time beyond the specified cooking time.
4. In the case of two or more different cooking modes being carried out, the specified cooking time starts to count from the point when the cooking mode is changed.
5. If the cooking mode has the power level display, the power level is also displayed when the limitations of power output are carried out.

DOOR OPEN MECHANISM

The door can be opened by pushing the open button on the control panel. When the open button is pushed, the open lever pushes lower latch head on the door upward. The upper latch head is linked with the lower latch head, so now, the door can be opened.

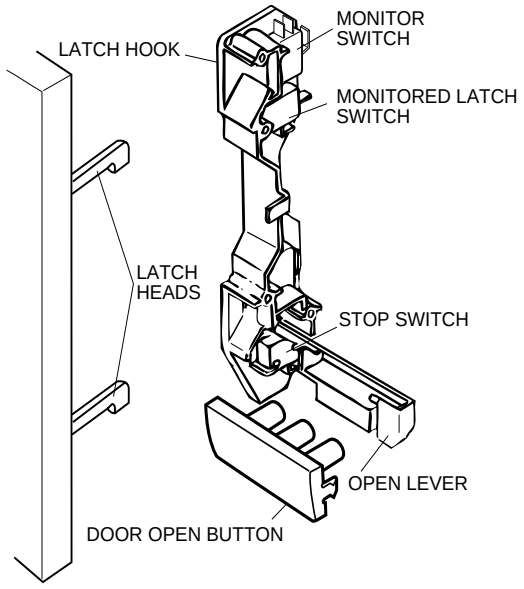


Figure D-1. Door Open Mechanism

MONITORED LATCH SWITCH SW1

1. When the oven door is closed, the contacts (COM-NO) of the switch must be closed. And the contacts (COM-NC) must be opened.
2. When the oven door is opened, the contacts (COM-NO) of the switch must be opened. And the contacts (COM-NC) must be closed.

STOP SWITCH SW2

1. When the oven door is closed, the contacts (COM-NO) of the switch must be closed.
2. When the oven door is opened, the contacts (COM-NO) of switch must be opened.

FUNCTION OF IMPORTANT COMPONENTS

MONITOR SWITCH SW3

The monitor switch is activated (the contacts opened) by the upper latch head on the door while the door is closed. The switch is intended to render the oven inoperative by means of blowing the fuse F2 F8A when the contacts of the monitored latch switch SW1 fail to open when the door is opened.

Function

1. When the door is opened, the contacts (COM-NC) of monitor switch SW3 close (to the ON condition) due to their being normally closed and contacts (COM-NO) open. At this time the contacts (COM-NO) of monitored latch switch SW1 is in the OFF condition (contacts open) due to their being normally open contact switches.
2. As the door goes to a closed position, the monitor switch SW3 contacts (COM-NC) are opened and contacts (COM-NO) closed and then contacts (COM-NO) of monitored latch switch SW1 and stop switch SW2 are closed.(On opening the door, each of these switches operate inversely.)
3. If the door is opened and the monitored latch switch SW1 contacts (COM-NO) fail to open, the fuse F2 (F8A) blows immediately after closing of the monitor switch (COM-NC) contacts.

CAUTION: BEFORE REPLACING A BLOWN FUSE F2 F8A, TEST THE MONITORED LATCH SWITCH SW1 AND MONITOR SWITCH SW3 FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE").

FUSE F2 F8A 250V

1. If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.
2. The fuse also blows when monitored latch switch SW1 remains closed with the oven door open and when the monitor switch SW2 contact (COM-NC) closes.
3. The fuse also blows when the asymmetric rectifier, H.V. rectifier,.H.V. wire harness, H.V. capacitor, magnetron or secondary winding of high voltage transformer is shorted

TC TRANSFORMER

TC transformer converts A.C. line voltage into low voltage to drive the control unit.

THERMAL CUT-OUT TC1 150˚C (OVEN)

The thermal cut out protects the oven against overheat during grill cooking, convection cooking or dual (combination) cooking. If the temperature rises above 150˚C because the fan motor is interrupted, the air inlet duct is blocked or the ventilation openings are obstructed, the thermal cut-out opens and switches off the all electrical parts.

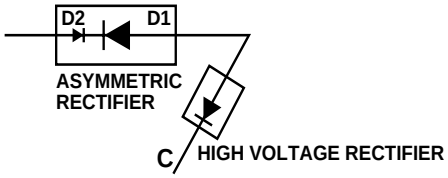
When the oven cools itself down to the operating temperature of 130˚C, the contacts of the thermal cut-out will close again.

THERMAL CUT-OUT TC2 125˚C (MG)

This thermal cut-out protects the magnetron against overheat. If the temperature goes up higher than 125˚C because the fan motor is interrupted or the ventilation openings are blocked, the thermal cut-out TC2 will open and line voltage to the high voltage transformer T will cut off and operation of the magnetron MG will be stopped. The defective thermal cut-out must be replaced with a new one.

ASYMMETRIC RECTIFIER

The asymmetric rectifier is solid state device that prevents current flow is both directions. And it prevents the temperature rise of the power transformer by blowing the fuse F2 F8A when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage. (The process of the blowing the fuse F2 F8A.)

1. The high voltage rectifier is shorted by any causes when microwave cooking or dual cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the high voltage transformer.
5. The large electric currents beyond 8A flow through the primary winding of the high voltage transformer.
6. The fuse F2 F8A blows by the large electric currents.
7. The power supplying to the high voltage transformer is cut off.

NOISE FILTER

The noise filter assembly prevents radio frequency interference that might flow back in the power circuit.

TURNTABLE MOTOR TTM

The turntable motor drives the roller stay to rotate the turntable.

FAN MOTOR FM

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channeled through the oven cavity to remove steam and vapours given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity.

CONVECTION MOTOR CM

The convection motor drives the convection fan and provide the heated air.

TOP GRILL HEATING ELEMENT GH

The grill heating element is provided to brown the food and is located on the top of the oven cavity.

BOTTOM GRILL HEATING ELEMENT BH

The grill heating element is provided to brown the food and is located at the base of the oven cavity.

FUNCTION OF IMPORTANT COMPONENTS

CONVECTION COOKING SYSTEM

This oven is designed with a hot air heating system where food is heated by forced circulation of the hot air produced by the grill heaters.

The air heated by the grill heaters is circulated through the convection passage provided on the outer casing of the oven cavity by means of the convection fan which is driven by the convection motor. It is then circulated inside the oven through the vent holes provided on the back side of the oven. Next, the hot air heats the food on the turntable and leaves the oven cavity through the vent in the oven cavity rear wall.

In this way, the hot air circulates inside the oven cavity to raise its temperature and, at the same time, comes into contact with the food being cooked.

When the temperature inside the oven cavity reaches the selected temperature, the heating elements are de-energized. When the temperature inside the oven cavity drops below the selected temperature, the heating elements are energized again. In this way, the inside of the oven cavity is maintained at approximately the selected temperature.

When the convection time reaches "0", the heating elements are de-energized and the convection fan stops operating and the oven shuts off. At the high temperature (more than 104˚C), the fan motor remains rotating. Automatically the fan motor will be shut down at low temperature (less than 104˚C).

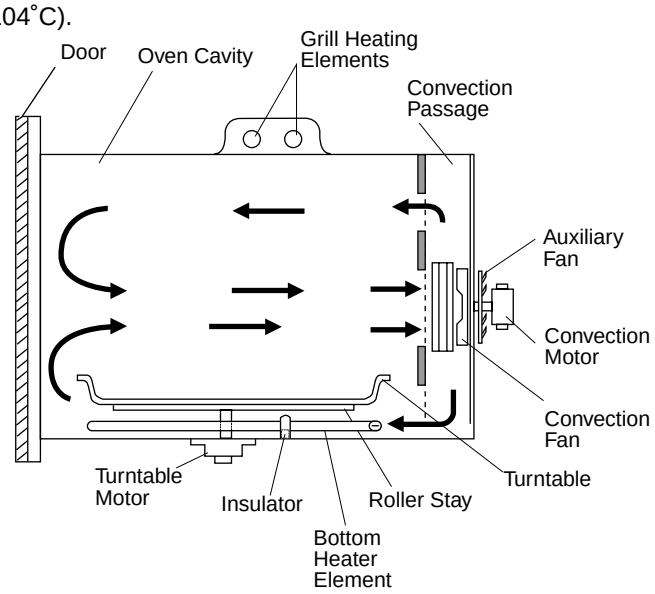


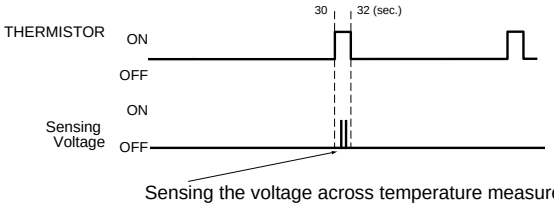
Figure D-2. Convection Cooking System

FIRE SENSING FEATURE

The oven will stop its operation when there is a fire in the oven cavity in microwave cooking condition.

The LSI measures the voltage across the temperature measurement circuit intermittently within a 32-second time base after the oven is started in microwave cooking condition. The oven will stop its operation when the difference of the voltage is more than 0.781 volts in microwave cooking condition.

1. Within a 32-seconds base, the thermistor is energized for 2 seconds. At that time, the voltage across the temperature measurement circuit is measured.
2. The oven carries out the procedure above again. If the second voltage is 0.781V higher than first voltage, the LSI judges it is a fire in the oven cavity and will stop the oven.
3. When the LSI judges it is a fire in the oven cavity, LSI will switch off the relays to high voltage transformer and fan motor and LSI stops countring down.



OPEN JUDGE BY THERMISTOR

1. If the temperature of the thermistor does not rise to more than 40˚C after 4 minutes and 15 seconds from when the oven is started in convection, grill (top and bottom grills) or dual cooking mode, the oven is turned off.
2. When the thermistor or the wire harness to the thermistor is opened, the oven is turned off after 4 minutes and 15 seconds because this condition is same as above.

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse F2 (F8A) in the monitored latch switch - monitor switch circuit, check the monitored latch switch and monitor switch before replacing the fuse F2 (F8A).

TROUBLESHOOTING GUIDE

TEST PROCEDURE			A	B	C		D	E	E	F	G	G	H	H	H	I	J	K	L	L		M	N	O	O	O	O	O	O	P				
			MAGNETRON	HIGH VOLTAGE TRANSFORMER	H.V. RECTIFIER ASSEMBLY	H.V. HARNESS	HIGH VOLTAGE CAPACITOR	MONITORED LATCH SWITCH SW1	STOP SWITCH SW2	MONITOR SWITCH SW3	THERMISTOR	THERMAL CUT-OUT 125˚C TC1	THERMAL CUT-OUT 150˚C TC2	TURNTABLE MOTOR	FAN MOTOR	CONVECTION FAN MOTOR	NOISE FILTER	FUSE 20A F1	FUSE F8A F2	TOP GRILL HEATING ELEMENT	BOTTOM GRILL HEATING ELEMENT	TC TRANSFORMER	TOUCH CONTROL PANEL	KEY UNIT	RELAY RY1	RELAY RY2	RELAY RY3	RELAY RY4	RELAY RY5	RELAY RY6	RELAY RY7	FOIL PATTERN ON P.W.B.	POWER SUPPLY CORD	OVEN LAMP OR SOCKET	SHORTED WIRE HARNESS	OPENED WIRE HARNESS	BLOCKED VENTILATION OPENINGS	MIS-ADJUSTMENT OF SWITCHES	HOME FUSE OR BREAKER	NO POWER AT WALL OUTLET	BLOCKED CONVECTION FAN	BLOCKED COOLING FAN
POSSIBLE CAUSE AND DEFECTIVE PARTS	CONDITION	PROBLEM																																	
OFF CONDITION		Fuse F2 F8A blows when the door is opened.						●											●																
		Home fuse blows when power cord is plugged into wall outlet.																●																	
		Fuse F1 20A blows when power cord is plugged into wall outlet.														●	●																		
		Nothing appears in display when power cord is plugged into wall outlet and the door is opened and closed.						●			●	●				●	●					●									●				
		Display does not operate properly when STOP key is touched.							●														●												
		Oven lamp does not light when door is opened. (Display operates.)							●														●	●											
COOKING CONDITION (COMMON MODE)		Oven does not start when the START key is touched. (Display operates.)							●														●												
		Oven lamp does not light and turntable motor does not operate.											●	●										●											
		Fan motor does not operate. (Oven lamp lights.)													●																				
		Convection fan motor does not operate. (Oven lamp lights.)														●																			
		Turntable motor does not operate. (Oven lamp lights.)							●					●																					
		Oven or any electrical parts (except fan motor) does not stop when cooking time is 0 or STOP key is touched.																							●	●	●	●	●	●	●				
		Oven stops after 4 minutes and 15 seconds since START key is touched. (Except Microwave and Dual Cook modes)								●													●												
		Display operates properly but all electrical parts do not operate.																						●	●	●	●	●	●	●					
		Oven goes into cook cycle but shuts down before end of cooking cycle.									●	●	●	●	●	●																			
		After cooking, the temperature of oven cavity is higher than 105˚C but fan motor does not operate.								●													●												
MICROWAVE COOKING CONDITION		Oven seems to be operating but little or no heat is produced in oven load. (Microwave power control is set at HIGH)	●	●	●	●	●	●	●										●				●		●									
		Oven does not seem to be operating properly during variable cooking condition except HIGH cooking condition.																							●										
		Oven goes into cook cycle but shuts down before end of cooking cycle.								●	●	●			●																				
CONVECTION COOKING CONDITION		Convection cooking mode does not heat.								●											●	●	●	●												
		Oven seems to be operating but the temperature in the oven cavity is lower or higher than preset one.								●						●					●	●	●												
GRILL COOKING CONDITION		Grill heating element does operate.																			●	●					●	●							
DUAL COOKING CONDITION (COMMON MODE)		Oven goes into cook cycle but shuts down before end of cooking cycle.								●	●	●			●								●												
		Oven seems to be operating but little or no heat is produced in oven load. (Microwave power does not seem to be generated properly)	●	●	●	●	●	●	●										●				●		●									
DUAL COOKING CONDITION (MICRO./CONV.)		Oven seems to be operating but the temperature in the oven cavity is lower or higher than preset one.								●					●						●	●	●												
		Top and Bottom Grill heating elements do not heat.						●													●	●					●	●							
DUAL COOKING CONDITION (MICRO./GRILL)		Top or Bottom Grill heating element does not heat.																			●	●					●	●							

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

A **MAGNETRON TEST**

NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.

CARRY OUT 3D CHECK

Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.

To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

MICROWAVE OUTPUT POWER (IEC-705-1988)
The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it can be measured by using water load how much it can be absorbed by the water load. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t(second), approximately P x t/4.187 calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT (°C) during this microwave heating period, the calorie of the water is V x ΔT.

The formula is as follows;
P x t / 4.187 = V x Δ T P (W) = 4.187 x V x ΔT / t
Our condition for water load is as follows:
Room temperature.....around 20°C Power supply Voltage.....Rated voltage
Water load.....1000 g Initial temperature.....10±2°C Heating time...47+3=50 sec.
P=90xΔT

Measuring condition:
1. Container
   The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.
2. Temperature of the oven and vessel
   The oven and the empty vessel are at ambient temperature prior to the start the test.
3. Temperature of the water
   The initial temperature of the water is (10±2)°C.
4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.
5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.
6. The graduation of the thermometer must be scaled by 0.1°C at minimum and accurate thermometer.
7. The water load must be (1000±5) g.
8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 3" sec. 3 sec. is magnetron filament heat-up time.

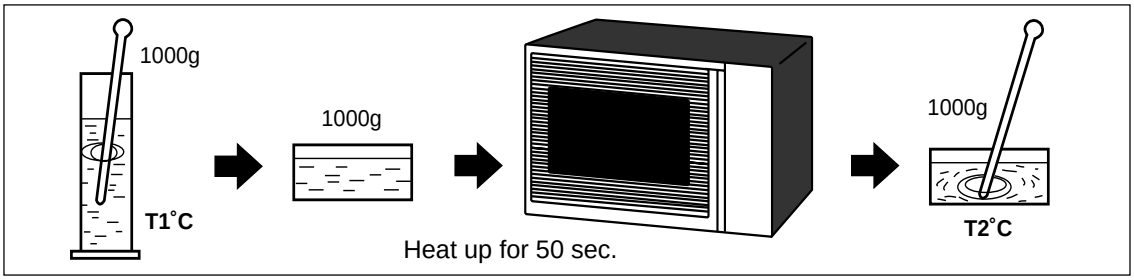
Measuring method:
1. Measure the initial temperature of the water before the water is added to the vessel.
   (Example: The initial temperature T1 = 11°C)
2. Add the 1 litre water to the vessel.
3. Place the load on the centre of the shelf.
4. Operate the microwave oven at HIGH for the temperature of the water rises by a value Δ T of (10 $\pm$ 2) K.
5. Stir the water to equalize temperature throughout the vessel.

6. Measure the final water temperature. (Example: The final temperature T2 = 21°C)
7. Calculate the microwave power output P in watts from above formula.

Initial temperature	T1 = 11°C
Temperature after (47 + 3) = 50 sec.	T2 = 21°C
Temperature difference Cold-Warm	ΔT1 = 10°C
Measured output power	
The equation is "P = 90 x ΔT"	P = 90 x 10°C = 900 Watts

JUDGMENT: The measured output power should be at least ± 15 % of the rated output power.

CAUTION: 1°C CORRESPONDS TO 100 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B HIGH VOLTAGE TRANSFORMER TEST

WARNING: High voltages and large currents are present at the secondary winding and filament winding transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

CARRY OUT 3D CHECKS

Disconnect the leads to the primary winding of the high voltage transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained:-

a. Primary winding	2 ohms approximately
b. Secondary winding	130 ohms approximately
c. Filament winding	less than 1 ohm

If the reading obtained are not stated above, then the high voltage transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

C HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

HIGH VOLTAGE RECTIFIER TEST

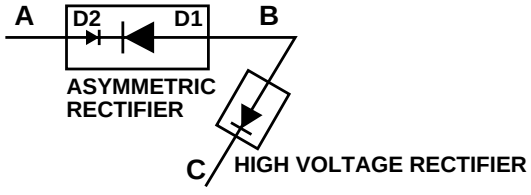
CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than 100 kΩ in the other direction.

CARRY OUT 4R CHECKS

ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.



PROCEDURE LETTER	COMPONENT TEST

Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric can be tested using an ohmmeter set to its highest range across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both direction then the asymmetric rectifier is good. If an asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the power transformer is shorted.

CARRY OUT 4R CHECKS

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

D **HIGH VOLTAGE CAPACITOR TEST**

CARRY OUT 3D CHECKS

A. Isolate the high voltage capacitor from the circuit.
B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.
D. A short-circuited capacitor shows continuity all the time.
E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.
F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS

E **SWITCH TEST**

CARRY OUT 3D CHECKS

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	O.C.	S.C.
Depressed	S.C.	O.C.

COM; Common terminal, NO; Normally open terminal NC; Normally close terminal
S.C.; Short, O.C.; Open circuit

If incorrect readings are obtained, make the necessary switch or replace the switch.

CARRY OUT 4R CHECKS.

F **THERMISTOR TEST**

CARRY OUT 3D CHECKS.
Disconnect theconnector B from CPU unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to Pin No's C1 and C3 of the thermistor harness.

Room Temperature	Resistance
20˚C - 30˚C	Approximately 359.9 kΩ - 152 kΩ

If the meter does not indiicate above resistance, replace the thermistor.

CARRY OUT 4R CHECKS.

TEST PROCEDURES

PROCEDURE LETTER | **COMPONENT TEST**

G **THERMAL CUT-OUT TEST**

CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.

CARRY OUT 4R CHECKS

Table: Thermal Cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit). (˚C)	Temperature of "OFF" condition (open circuit). (˚C)	Indication of ohmmeter (When room temperature is approx. 20˚C.)
Thermal cut-out 150˚C TC1	Below 130˚C	Above 150˚C	Closed circuit
Thermal cut-out 125˚C TC2	This is not resetable type	Above 125˚C	Closed circuit

If incorrect readings are obtained, replace the thermal cut-out.
An open circuit thermal cut-out (MG) TC2 indicates that the magnetron has overheated, this may be due to resistricted ventilation, cooling fan failure.
An open circuit thermal cut-out (OVEN) TC1 indicates that the oven cavity has overheated, this may be due to no load operation.

H **MOTOR WINDING TEST**

CARRY OUT 3D CHECKS

Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

Motors	Resistance
Fan motor	Approximately 292Ω
Turntable motor	Approximately 14.5kΩ
Convection fan motor	Approximately 290 Ω

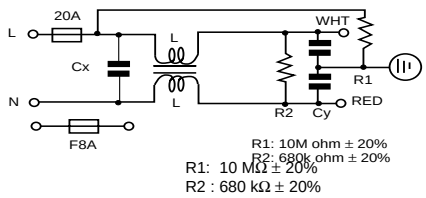
If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS

I **NOISE FILTER TEST**

CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of noise filter.
Using an ohmmeter, check between the terminals as described in the following table.



L (min)	Cx ± 20%	Cy ± 20%
1.0mH	0.22µF	4700pF

MEASURING POINTS	INDICATION OF OHMMETER
Between N and L	Approx. 680 kΩ
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

If incorrect readings are absorbed, replace the noise filter unit.

CARRY OUT 4R CHECKS

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

J **FUSE F1 20A**

CARRY OUT 3D CHECKS

If the fuse F1 20A is blown, there is a shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS

CAUTION: Only replace fuse with the correct value replacement.

K **BLOWN FUSE F2 F8A**

CARRY OUT 3D CHECKS

1. If the fuse F2 F8A is blown when the door is opened, check the monitored latch switch and monitor switch.
2. If the fuse F2 F8A is blown by incorrect door switching replace the defective switch(es) and the fuse F2 F8A.
3. If the fuse F2 F8A is blown, there could be shorts in the asymmetric rectifier or there is a ground in wire harness. A short in the asymmetric rectifier may be occurred due to short or ground in H.V. rectifier, magnetron, high voltage transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS

CAUTION: Only replace fuse F2 F8A with the correct value replacement.

L **TOP AND BOTTOM GRILL HEATING ELEMENT TEST**

CARRY OUT 3D CHECKS

Before carrying out the following tests make sure the heating element is cool completely.

1. Resistance of heating element.
   Disconnect the wire leads to the heating element to be tested. Using ohmmeter with low resistance range. Check the resistance across the terminals of the heating element as described in the following table.

Table: Resistance of heating element

Parts name	Resistance
Bottom grill heating element	Approximately 56 Ω
Top grill heating element	Approximately 106Ω

2. Insulation resistance.
   Disconnect the wire leads to the heating element to be tested. Check the insulation resistance between the element terminal and cavity using a 500V - 100MΩ insulation tester. The insulation resistance should be more than 10M&ohm in the cold start.

If the results of above test 1 and/or 2 are out of above specifications, the heating element is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

M **TOUCH CONTROL PANEL ASSEMBLY TEST**

The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance can not be performed with only a voltmeter and ohmmeter.
In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit, and also the Control unit is divided into two units, CPU unit and Power unit, and troubleshooting by replacement is described according to the symptoms indicated.

1. Key Unit Note : Check key unit ribbon connection before replacement.
   The following symptoms indicate a defective key unit. Replace the key unit.
   a) When touching the pads, a certain pad produces no signal at all.
   b) When touching a number pad, two figures or more are displayed.
   c) When touching the pads, sometimes a pad produces no signal.
2. Control Panel
   The following symptoms indicate a defective control unit. Before replacing the control unit perform the key unit test (Procedure P) to determine if control unit is faulty.

2-1 In connection with pads
   a) When touching the pads, a certain group of pads do not produce a signal.
   b) When touching the pads, no pads produce a signal.

2-2 In connection with indicators
   a) At a certain digit, all or some segments do not light up.
   b) At a certain digit, brightness is low.
   c) Only one indicator does not light up.
   d) The corresponding segments of all digits do not light up; or they continue to light up.
   e) Wrong figure appears.
   f) A certain group of indicators do not light up.
   g) The figure of all digits flicker.

2-3 Other possible troubles caused by defective control unit.
   a) Buzzer does not sound or continues to sound.
   b) Clock does not operate properly.
   c) Cooking is not possible.
   d) Proper temperature measurement is not obtained.

N **KEY UNIT TEST**

If the display fails to clear when the STOP pad is depressed, first verify the flat ribbon cable is marking good contact, verify that the door sensing switch (stop switch) operates properly; that is the contacts are closed when the door is closed and open when the door is open. If the door sensing switch (stop switch) is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the door sensing switch is closed (either close the door or short the door sensing switch connecter). Use the Key unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the STOP pad marking momentary contact. If the control unit responds by clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is faulty and must be replaced. If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault.

	G 8	G 7	G 6	G 5	G 4	G 3	G 2	G 1
G 9						10 S	1 MIN	10 MIN
G10							×1 ×2 ×3	
G11		▲	▼	+1min				
G12		℃			STOP		×1 ×2 ×3	

CARRY OUT 4R CHECKS.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

O **RELAY TEST**

CARRY OUT 3D CHECKS.

Remove the outer case and check voltage between Pin Nos. 1 and 3 of the 4 pin connector (E) on the control unit with an A.C. voltmeter.
The meter should indicate 230-240 volts, if not check oven circuit.

Relay Test
Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation, grill operation, convection operation or dual operation.

DC. voltage indicated ..... Defective relay.
DC. voltage not indicated ..... Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 18.0V D.C.	Oven lamp / Turntable motor
RY2	Approx. 18.0V D.C.	High voltage transformer
RY3	Approx. 24.0V D.C.	Grill (Top) heating element
RY4	Approx. 24.0V D.C.	Bottom heating element
RY5	Approx. 24.0V D.C.	Touch control transformer
RY6	Approx. 24.0V D.C.	Fan motor
RY7	Approx. 24.0V D.C.	Convection motor

CARRY OUT 4R CHECKS.

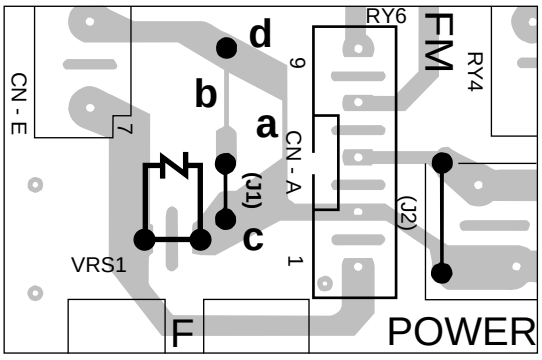
P **PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD (PWB) IS OPEN**

To protect the electronic circuits, this model is provided with a fine foil pattern added to the input circuit on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.
Problem: POWER ON, indicator does not light up.

CARRY OUT 3D CHECKS.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present between Pin Nos. 1 and 3 of the 4-pin connector (E).	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder. (CARRY OUT 3D CHECKS BEFORE REPAIR.)
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT 3D CHECKS BEFORE REPAIR.)

NOTE: *At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short circuit (check primary coil resistance).
If any abnormal condition is detected, replace the defective parts.



CARRY OUT 4R CHECKS.

TOUCH CONTROL

TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

(1) Key Unit
(2) Control Unit (The Control unit consists of Power unit and CPU unit.)

The principal functions of these units and signals communicated among them are explained below.

Key Unit
The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit from P40, P41, P72, P73 P74, P75, P76 and P77.
When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through P44 - P47 to perform the function that was requested.

Control Unit
Control unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit, relay circuit, temperature measurement circuit, indicator circuit and back light circuit.

1) LSI
This LSI controls the temperature measurement signal, key strobe signal, relay driving signal for oven function and indicator signal.

2) Power Source Circuit
This circuit generates voltage necessary in the control unit.

Symbol	Voltage	Application
VC	-5.2V	LSI(IC1)

3) Synchronizing Signal Circuit
The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

4) ACL
A circuit to generate a signal which resets the LSI to the initial state when power is supplied.

5) Buzzer Circuit
The buzzer is responsive to signals from the LSI to emit audible sounds (key touch sound and completion sound).

6) Door Sensing Switch (Stop Switch)
A switch to "tell" the LSI if the door is open or closed.

7) Relay Circuit
To drive the magnetron, grill heating element, bottom heating element, convection motor, fan motor, turntable motor, touch control transformer and light the oven lamp.

8) Back Light Circuit
A circuit to drive the back light (Light emitting diodes LD1 - LD10).

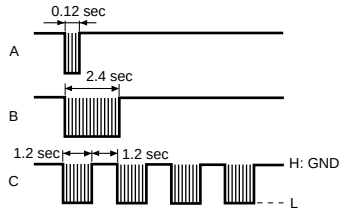
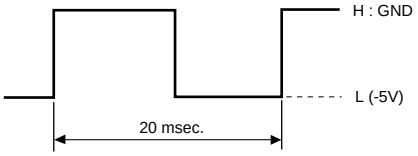
9) Indicator Circuit
This circuit consists 7-digits, 39-segments and 3-common electrodes using a Liquid Crystal Display.

10) Temperature Measurement Circuit : (OVEN THERMISTOR)
The temperature in the oven cavity is sensed by the thermistor. The variation of resistance according to sensed temperature is detected by the temperature measurement circuit and the result applied to LSI. The LSI uses this information to control the relay and display units.

DESCRIPTION OF LSI

LSI(IZA965DR)

The I/O signal of the LSI(IZA965DR) are detailed in the following table.

Pin No.	Signal	I/O	Description
1	C1	IN	Terminal not used.
2	VL1	IN	**Power source voltage input terminal.** Standard voltage for LCD.
3	AN7	IN	Terminal to change the on timing of the cook relay (RY2).
4-5	AN6-AN5	IN	**Heating constant compensation terminal.**
6	AN4	OUT	Terminal not used.
7	AN3	IN	**Temperature measurement input: OVEN THERMISTOR.** By inputting DC voltage corresponding to the temperature detected by the thermistor, this input is converted into temperature by the A/D converter built into the LSI.
8	AN2	IN	**Input signal which communicates the door open/close information to LSI.** Door closed; "H" level signal. Door opened; "L" level signal.
9-10	AN1-AN0	OUT	Terminal not used.
11	P57	OUT	**Timing signal output terminal for temperature measurement(OVEN THERMISTOR).** "H" level (GND) : Thermistor OPEN timing. "L" level (-5V) : Temperature measuring timing. (Convection cooking)
12	P56	OUT	**Signal to sound buzzer.** A: key touch sound. B: Completion sound. C: When the temperature of the oven cavity reaches the preset temperature in the preheating mode, or when the preheating hold time (30 minutes) is elapsed. 
13	P55	OUT	**Timing signal output terminal for temperature measurement(OVEN THERMISTOR).** "H" level (GND) : Thermistor OPEN timing. "L" level (-5V) : Temperature measuring timing. (Convection cooking)
14-18	P54-P50	OUT	Terminal not used.
19	P47	IN	**Signal coming from touch key.** When any one of G12 line keys on key matrix is touched, a corresponding signal from P40, P41, P72, P73, P74, P75, P76 and P77 will be input into P47. When no key is touched, the signal is held at "L" level.
20	P46	IN	**Signal similar to P47.** When any one of G11 line keys on key matrix is touched, a corresponding signal will be input into P46.
21	P45	IN	**Signal similar to P47.** When any one of G10 line keys on key matrix is touched, a corresponding signal will be input into P45.
22	P44	IN	**Signal similar to P47.** When any one of G9 line keys on key matrix is touched, a corresponding signal will be input into P44.
23	INT1	OUT	Terminal not used.
24	INT0	IN	**Signal to synchronized LSI with commercial power source frequency(50Hz).** This is basic timing for time processing of LSI. 

DESCRIPTION OF LSI

LSI(IZA965DR)

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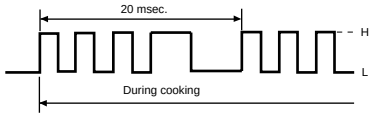
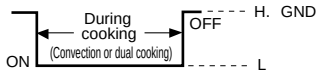
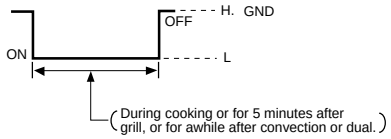
<table>
<tr><th>Pin No.</th><th>Signal</th><th>I/O</th><th>Description</th></tr>
<tr><td>25</td><td>P41</td><td>OUT</td><td><u>Key strobe signal.</u>
Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G8 line key on matrix is touched.</td></tr>
<tr><td>26</td><td>P40</td><td>OUT</td><td><u>Key strobe signal.</u>
Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G7 line key on matrix is touched.</td></tr>
<tr><td>27</td><td>P77</td><td>OUT</td><td><u>Key strobe signal.</u>
Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G6 line key on matrix is touched.</td></tr>
<tr><td>28</td><td>P76</td><td>OUT</td><td><u>Key strobe signal.</u>
Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G5 line key on matrix is touched.</td></tr>
<tr><td>29</td><td>P75</td><td>OUT</td><td><u>Key strobe signal.</u>
Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G4 line key on matrix is touched.</td></tr>
<tr><td>30</td><td>P74</td><td>OUT</td><td><u>Key strobe signal.</u>
Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G3 line key on matrix is touched.</td></tr>
<tr><td>31</td><td>P73</td><td>OUT</td><td><u>Key strobe signal.</u>
Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G2 line key on matrix is touched.</td></tr>
<tr><td>32</td><td>P72</td><td>OUT</td><td><u>Key strobe signal.</u>
Signal applied to touch-key section. A pulse signal is input to P44 - P47 terminal while one of G1 line key on matrix is touched.</td></tr>
<tr><td>33</td><td>P71</td><td>OUT</td><td><u>Oven lamp and turntable motor driving signal(Square Waveform : 50Hz).</u>
To turn on and off shut-off relay (RY1). The square waveform voltage is delivered to the relay (RY1) driving circuit.
 
</td></tr>
<tr><td>34</td><td>P70</td><td>IN</td><td>Connected to VC.</td></tr>
<tr><td>35</td><td>RESET</td><td>IN</td><td><u>Auto clear terminal.</u>
Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "H" level.</td></tr>
<tr><td>36</td><td>P81</td><td>OUT</td><td><u>Magnetron high-voltage circuit driving signal.</u>
To turn on and off the cook relay (RY2). In 100% operation, the signals hold "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (70%, 50%, 30%, 10%) the signal turns to "H" level and "L" level in repetition according to the power level.
ON/OFF time ratio in Micro cooking (a. 32second time base)
<table>
<tr><th>MICRO COOK</th><th>ON</th><th>OFF</th></tr>
<tr><td>100%</td><td>32 sec.</td><td>0 sec.</td></tr>
<tr><td>70%</td><td>24 sec.</td><td>8 sec.</td></tr>
<tr><td>50%</td><td>18 sec.</td><td>14 sec.</td></tr>
<tr><td>30%</td><td>12 sec.</td><td>20 sec.</td></tr>
<tr><td>10%</td><td>6 sec.</td><td>26 sec.</td></tr>
</table>
ON/OFF time ratio in Micro cooking (a. 48second time base)
<table>
<tr><th>MICRO COOK</th><th>ON</th><th>OFF</th></tr>
<tr><td>100%</td><td>48 sec.</td><td>0 sec.</td></tr>
<tr><td>70%</td><td>36 sec.</td><td>12 sec.</td></tr>
<tr><td>50%</td><td>26 sec.</td><td>22 sec.</td></tr>
<tr><td>30%</td><td>16 sec.</td><td>32 sec.</td></tr>
<tr><td>10%</td><td>8 sec.</td><td>40 sec.</td></tr>
</table></td></tr>
<tr><td>37</td><td>P80</td><td>OUT</td><td><u>Grill (TOP) heating element driving signal.</u>
To turn on and off the grill heating element relay (RY3). "L" level during grill cooking, convection cooking or dual cooking, "H" level otherwise. The heater relay turns on and off within a 48 second time base in accordance with the special program in LSI.
<table>
<tr><th>Power output</th><th>ON time</th><th>OFF time</th></tr>
<tr><td>100 %</td><td>48 sec.</td><td>0 sec.</td></tr>
<tr><td>90 %</td><td>44 sec.</td><td>4 sec.</td></tr>
<tr><td>80 %</td><td>40 sec.</td><td>8 sec.</td></tr>
<tr><td>70 %</td><td>36 sec.</td><td>12 sec.</td></tr>
<tr><td>60 %</td><td>32 sec.</td><td>16 sec.</td></tr>
<tr><td>50 %</td><td>26 sec.</td><td>22 sec.</td></tr>
<tr><td>40 %</td><td>22 sec.</td><td>26 sec.</td></tr>
<tr><td>30 %</td><td>16 sec.</td><td>32 sec.</td></tr>
<tr><td>20 %</td><td>12 sec.</td><td>36 sec.</td></tr>
<tr><td>10 %</td><td>8 sec.</td><td>40 sec.</td></tr>
</table></td></tr>
</table>

DESCRIPTION OF LSI

LSI(IZA965DR)

The I/O signal of the LSI(IZA965DR) are detailed in the following table.

<table>
<tr><th>Pin No.</th><th>Signal</th><th>I/O</th><th>Description</th></tr>
<tr><td>38</td><td>XIN</td><td>IN</td><td><u>Internal clock oscillation frequency input setting.</u>
The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XIN terminal.</td></tr>
<tr><td>39</td><td>XOUT</td><td>OUT</td><td><u>Internal clock oscillation frequency control output.</u>
Output to control oscillation input of XOUT.</td></tr>
<tr><td>40</td><td>VSS</td><td>IN</td><td><u>Power source voltage: -5V.</u>
VC voltage of power source circuit input.</td></tr>
<tr><td>41</td><td>P27</td><td>OUT</td><td><u>Bottom heating element driving signal.</u>
To turn on and off the relay (RY4). "L" level during grill cooking, convection cooking or dual cooking, "H" level otherwise.
The heater relay turns on and off within a 48 second time base in accordance with the special program in LSI.
<table>
<tr><th>Power output</th><th>ON time</th><th>OFF time</th></tr>
<tr><td>100 %</td><td>48 sec.</td><td>0 sec.</td></tr>
<tr><td>90 %</td><td>44 sec.</td><td>4 sec.</td></tr>
<tr><td>80 %</td><td>40 sec.</td><td>8 sec.</td></tr>
<tr><td>70 %</td><td>36 sec.</td><td>12 sec.</td></tr>
<tr><td>60 %</td><td>32 sec.</td><td>16 sec.</td></tr>
<tr><td>50 %</td><td>26 sec.</td><td>22 sec.</td></tr>
<tr><td>40 %</td><td>22 sec.</td><td>26 sec.</td></tr>
<tr><td>30 %</td><td>16 sec.</td><td>32 sec.</td></tr>
<tr><td>20 %</td><td>12 sec.</td><td>36 sec.</td></tr>
<tr><td>10 %</td><td>8 sec.</td><td>40 sec.</td></tr>
</table></td></tr>
<tr><td>42</td><td>P26</td><td>OUT</td><td><u>Convection motor driving signal.</u>
To turn on and off shut-off relay(RY7). "L" level during convection or dual cooking "H" level otherwise. (Relay RY7 does not turn on at preheating mode.)
 
</td></tr>
<tr><td>43</td><td>P25</td><td>OUT</td><td><u>Fan motor driving signal.</u>
To turn on and off the fan motor relay RY6. "L" level during cooking, or for 5 minutes after grill cooking, or for a while after convection or dual cooking. "H" level otherwise.
 
</td></tr>
<tr><td>44</td><td>P24</td><td>OUT</td><td>Terminal not used.</td></tr>
<tr><td>45</td><td>P23</td><td>OUT</td><td><u>Touch control transformer driving signal.</u>
To turn on and off the shut off relay (RY5). If the oven has not been used for more than 2 minutes, the relay RY5 will be turned off. The relay RY5 will be turned on when the oven door is opened and closed.</td></tr>
<tr><td>46-48</td><td>P22-P20</td><td>OUT</td><td>Terminal not used.</td></tr>
<tr><td>49-50</td><td>P17-P16</td><td>IN</td><td>Terminal to change functions according to the model.</td></tr>
<tr><td>51-80</td><td>SEG39-SEG10</td><td>OUT</td><td><u>Segment data signal.</u>
Connected to LCD.
The relation between signals are as follows:
<table>
<tr><th>LSI signal (Pin No.)</th><th>LCD (Pin No.)</th><th>LSI signal (Pin No.)</th><th>LCD (Pin No.)</th></tr>
<tr><td>SEG 0 (90)</td><td>SEG39 (51)</td><td>SEG21 (69)</td><td>SEG19 (19)</td></tr>
<tr><td>SEG 1 (89)</td><td>SEG38 (50)</td><td>SEG22 (68)</td><td>SEG18 (18)</td></tr>
<tr><td>SEG 2 (88)</td><td>SEG37 (49)</td><td>SEG23 (67)</td><td>SEG17 (17)</td></tr>
<tr><td>SEG 3 (87)</td><td>SEG36 (48)</td><td>SEG24 (66)</td><td>SEG16 (16)</td></tr>
<tr><td>SEG 4 (86)</td><td>SEG35 (47)</td><td>SEG25 (65)</td><td>SEG15 (15)</td></tr>
<tr><td>SEG 5 (85)</td><td>SEG34 (46)</td><td>SEG26 (64)</td><td>SEG14 (14)</td></tr>
<tr><td>SEG 6 (84)</td><td>SEG33 (45)</td><td>SEG27 (63)</td><td>SEG13 (13)</td></tr>
<tr><td>SEG 7 (83)</td><td>SEG32 (44)</td><td>SEG28 (62)</td><td>SEG12 (12)</td></tr>
<tr><td>SEG 8 (82)</td><td>SEG31 (43)</td><td>SEG29 (61)</td><td>SEG11 (11)</td></tr>
<tr><td>SEG10 (80)</td><td>SEG30 (30)</td><td>SEG30 (60)</td><td>SEG10 (10)</td></tr>
<tr><td>SEG11 (79)</td><td>SEG29 (29)</td><td>SEG31 (59)</td><td>SEG 9 (9)</td></tr>
<tr><td>SEG12 (78)</td><td>SEG28 (28)</td><td>SEG32 (58)</td><td>SEG 8 (8)</td></tr>
<tr><td>SEG13 (77)</td><td>SEG27 (27)</td><td>SEG33 (57)</td><td>SEG 7 (7)</td></tr>
<tr><td>SEG14 (76)</td><td>SEG26 (26)</td><td>SEG34 (56)</td><td>SEG 6 (6)</td></tr>
<tr><td>SEG15 (75)</td><td>SEG25 (25)</td><td>SEG35 (55)</td><td>SEG 5 (5)</td></tr>
<tr><td>SEG16 (74)</td><td>SEG24 (24)</td><td>SEG36 (54)</td><td>SEG 4 (4)</td></tr>
<tr><td>SEG17 (73)</td><td>SEG23 (23)</td><td>SEG37 (53)</td><td>SEG 3 (3)</td></tr>
<tr><td>SEG18 (72)</td><td>SEG22 (22)</td><td>SEG38 (52)</td><td>SEG 2 (2)</td></tr>
<tr><td>SEG19 (71)</td><td>SEG21 (21)</td><td>SEG39 (51)</td><td>SEG 1 (1)</td></tr>
<tr><td>SEG20 (70)</td><td>SEG20 (20)</td><td></td><td></td></tr>
</table></td></tr>
</table>

DESCRIPTION OF LSI

LSI(IZA965DR)

The I/O signal of the LSI(IZA965DR) are detailed in the following table.

Pin No.	Signal	I/O	Description
81	SEG9	OUT	Terminal not used.
82-90	SEG8-SEG0	OUT	**Segment data signal.** Connected to LCD. Signal is similar to SEG39.
91	VCC	IN	Connected to GND.
92	VREF	IN	Connected to GND.
93	AVSS	IN	Connected to VC.
94	COM3	OUT	**Common data signal: COM3.** Connected to LCD (Pin No. 35).
95	COM2	OUT	**Common data signal: COM2.** Connected to LCD (Pin No. 34).
96	COM1	OUT	**Common data signal: COM1.** Connected to LCD (Pin No. 33).
97	COM4	OUT	Terminal not used.
98-99	VL3-VL2	IN	**Power source voltage input terminal.** Standard voltage for LCD.
100	C2	IN	Terminal not used.

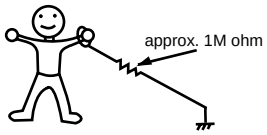
SERVICING

1. Precautions for Handling Electronic Components

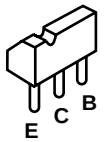
This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc., and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

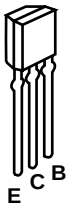
1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap PW boards containing them in aluminium foil.
2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



Transistor
2SB1238



Transistor
KRC243M

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so.

To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven :

CAUTION:
THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING AND PRESENTS A HAZARD .

Therefore, before checking the performance of the touch control panel,

1) Disconnect the power supply cord, and then remove outer case.
2) Open the door and block it open.
3) Discharge high voltage capacitor.
4) Disconnect the leads to the primary of the power transformer.
5) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6) After that procedure, re-connect the power supply cord.

After checking the performance of the touch control panel,

1) Disconnect the power supply cord.
2) Open the door and block it open.
3) Re-connect the leads to the primary of the power transformer.
4) Re-install the outer case (cabinet).
5) Re-connect the power supply cord after the outer case is installed.
6) Run the oven and check all functions.

A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated.

For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

B. On some models, the power supply cord between the touch control panel and the oven is long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if the dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel; it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

1) Soldering iron: 30W
   (It is recommended to use a soldering iron with a grounding terminal.)
2) Oscilloscope: Single beam, frequency range: DC - 10MHz type or more advanced model.
3) Others: Hand tools

5. Other Precautions

1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
5) Be sure to use specified components where high precision is required.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. CARRY OUT 3D CHECKS.
2. Make sure that a definite" click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click' as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.
Do not operate the oven if any of the following conditions exist;

1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal is damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Do not operate the oven:
1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

Please refer to 'OVEN PARTS, CABINET PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

OUTER CASE REMOVAL

To remove the outer case proceed as follows.
1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove backplate.
4. Remove the screws from rear and along the side edge of case.
5. Slide the entire case back about 3cm to free it from retaining clips on the cavity face plate.
6. Lift the entire case from the oven.
7. Discharge the H.V. capacitor before carrying out any further work.
8. Do not operate the oven with the outer case removed.

N.B.; Step 1, 2 and 6 form the basis of the 3D checks.

CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENT OR WIRING.

HIGH VOLTAGE COMPONENTS REMOVAL (HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY)

To remove the components, proceed as follows.
1. CARRY OUT 3D CHECKS
2. Disconnect all the leads and terminals of high voltage rectifier assembly from the high voltage capacitor.
3. Remove one (1) screw holding earth side terminal of high voltage rectifier assembly and remove capacitor holder.
4. Remove one (1) screw holding capacitor holder to oven cavity.
5. Release the capacitor holder from the duct.
6. Remove the capacitor from the capacitor holder.
7. Now high voltage rectifier assembly and capacitor should be free.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR HOLDER WITH AN EARTHING SCREW.

HIGH VOLTAGE TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the filament leads of high voltage transformer from high voltage capacitor and the magnetron.
3. Disconnect the H.V. wire A from the high voltage transformer.
4. Disconnect the main wire harness from the high voltage transformer.
5. Remove the two (2) screws and one (1) washer holding the transformer to base plate.
6. Remove the transformer.
7. Now the high voltage transformer is free.

CONTROL PANEL REMOVAL

1. CARRY OUT 3D CHECKS
2. Remove outer wrap.
3. Disconnect wiring panel.
4. Lift up the control panel assembly and pull it forward. Now the control panel assembly is free.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the H.V. wire B and filament lead of the transformer from the magnetron.
3. Remove the one (1) screw holding the chassis support to the magnetron.
4. Move the air intake duct to left.
5. Carefully remove four (4) screws holding magnetron to waveguide, when removing the screws hold the magnetron to prevent it from falling.
6. Remove the magnetron from the waveguide with care so the magnetron antenna is not hit by any metal object around the antenna.

CAUTION: WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS ARE TIGHTENED SECURELY.

FAN MOTOR REPLACEMENT

REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the noise filter to the chassis support.
3. Release the noise filter from the tabs of the fan duct.
4. Disconnect the wire leads from the fan duct.
5. Remove the one (1) screw holding the capacitor holder to the oven cavity back plate.
6. Release the tabs of the capacitor holder from the fan duct.
7. Remove the one (1) screw holding the fan duct to the oven cavity back plate.
8. Remove the fan duct from the oven.
9. Remove the fan duct from the fan motor shaft according the following procedure.
   1) Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

      CAUTION:
      - **Make sure that no swarf from the rotor enters the gap between the rotor & stator of the fan motor.**
      - **Avoid touching the coil of the fan motor with the pliers as the coil may become cut or damaged.**
      - **Avoid deforming the bracket whilst using the pliers.**

   2) Remove the fan blade assembly from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
   3) Now, the fan blade is free.

      CAUTION:
      - **Do not reuse the removed fan blade as the fixing hole may be oversize.**
10. Remove the two (2) screws and nuts holding the fan motor to the fan duct.
11. Now, the fan motor is free.

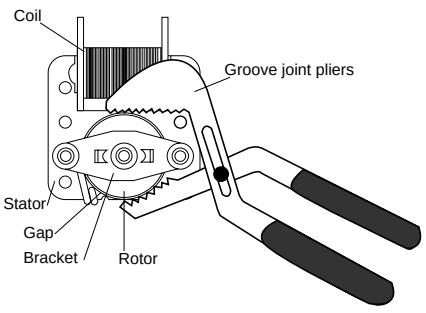
INSTALLATION

1. Install the fan motor to the fan duct with the two (2) screws.
2. Install the fan blade to the fan motor shaft according the following procedure.

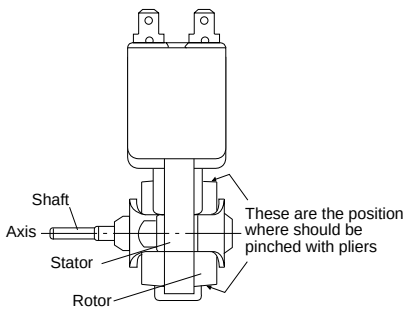
1) Hold the centre of the bracket which supports the shaft of the fan motor on the flat table.
2) Apply the screw lock tight into the hole (for shaft) of the fan blade.
3) Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

   CAUTION:
   - **Do not hit the fan blade strongly when installed because the bracket may be deformed.**
   - **Make sure that the fan blade rotates smoothly after installed.**
   - **Make sure that the axis of the shaft is not slanted.**

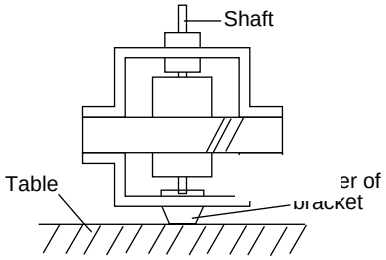
3. Install the fan duct to the oven cavity back plate with the one (1) screw.
4. Insert the tabs of the capacitor holder to the fan duct.
5. Install the capacitor holder to the oven cavity back plate with the one (1) screw.
6. Install the noise filter to the fan duct and the chassis support with the one (1) screw.
7. Re-connect the wire leads to the fan motor.



Rear view

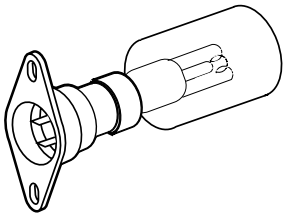


Side view



COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

OVEN LAMP SOCKET REMOVAL



1. CARRY OUT 3D CHECKS
2. Remove wire leads as positive lock connector removal below.
3. Lift up the oven lamp from its retaining clips.
4. Now, the oven lamp is free.

POSITIVE LOCK® CONNECTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Pushing the lever of positive lock® connector.
3. Pull out the positive lock® connector.

CAUTION: WHEN YOU (SERVICE ENGINEERS) CONNECT THE POSITIVE LOCK® CONNECTORS TO THE TERMINALS, CONNECT THE POSITIVE LOCK® SO THAT THE LEVER FACE YOU (SERVICE ENGINEERS).

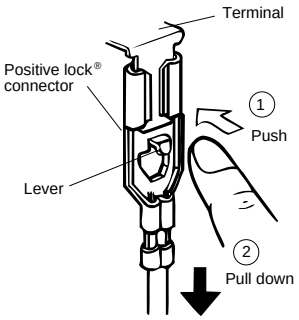


Figure C-2 Positive lock® connector

POWER SUPPLY CORD REPLACEMENT

Removal

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the green/yellow wire to the cavity back plate.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-4 (a).
4. Release the power supply cord from the rear cabinet.
5. Now, the power supply cord is free.

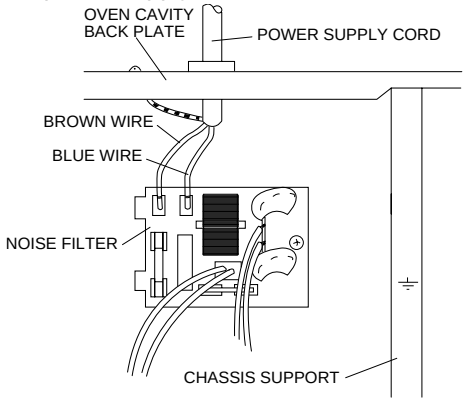


Figure C-4 (a) Replacement of Power Supply Cord

Re-install

1. Insert the moulding cord stopper of power supply cord into the square hole of the rear cabinet, referring to the Figure C-4 (b).
2. Install the earth wire lead of power supply cord to the oven cavity with one (1) screw and tight the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

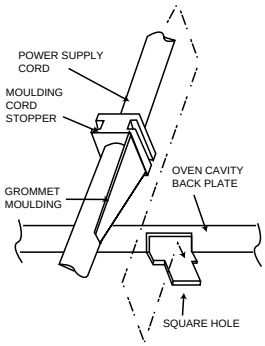


Figure C-4(b). Power Supply Cord Replacement

CONVECTION FAN MOTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the two (2) screws holding the back plate to oven cavity.
3. Disconnect the wire leads from the convection motor.
4. Remove the two (2) screws holding the rear heat cover to the oven cavity from out-side.
5. Remove the four (4) screws holding the convection fan duct to the oven cavity.
6. Now, the convection fan duct assembly is free.
7. Remove the one (1) nut holding the convection fan, washers, pipe and the cooling fan to the convection motor shaft.
8. Remove the three (3) screws holding the rear heat cover to the convection fan duct.
9. Remove the two (2) screws holding the convection motor to the rear heat cover.
10. Remove the pipe, washers and the cooling fan from the convection motor shaft.
11. Remove the ring on the convection motor shaft.
12. Now, the convection motor is free.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

TOP HEATING ELEMENT REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the two (2) screws holding the two (2) terminals of the main wire harness to the top heating element.
3. Remove the two (2) screws holding the two (2) grill heater angles to the top of the oven cavity.
4. Remove the two (2) grill heater angles from the oven cavity.
5. Remove the top heating element from the top of the oven cavity.
6. Now the top heating element is free.

BOTTOM HEATING ELEMENT REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the turntable motor cover from the base plate, referring to "TURNTABLE MOTOR REPLACEMENT".
3. Disconnect the wire leads from the bottom heating element.
4. Remove the two (2) nuts holding the bottom heating element to the oven cavity.
5. Remove the heater cover and the heater packing from the bottom heating element.
6. Remove the bottom heating element from the oven

MONITORED LATCH SWITCH, MONITOR SWITCH AND STOP SWITCH REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel assembly referring to "CONTROL PANEL ASSEMBLY REMOVAL".
3. Remove the open lever from the oven cavity front plate by removing the control panel assembly.
4. Disconnect the leads from all switches.
5. Remove the two (2) screws holding the latch hook to the oven cavity.
6. Remove the latch hook.
7. Remove the switch(es) from the latch hook by pushing the retaining tab backwards slightly and turning the switch(es) on the post.
8. Now the switch(es) is free.

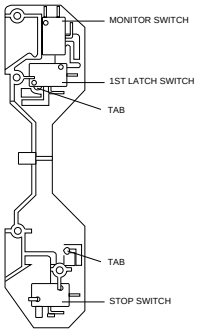


Figure C-5. Switches

MONITORED LATCH SWITCH, STOP SWITCH AND MONITOR SWITCH ADJUSTMENT

If the monitored latch switch, stop switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.

1. CARRY OUT 3D CHECKS.
2. Loosen the two (2) screws holding the latch hook to the oven cavity front flange.
3. With the door closed, adjust the latch hook by moving it back and forward or up and down. In and out play of the door allowed by the latch hook should be less than 0.5 mm. The horizontal position of the latch hook should be placed where the monitor switch has activated with the door closed. The vertical position of the latch hook should be placed where the monitored latch switch and stop switch have activated with the door closed.
4. Secure the screws with washers firmly.
5. Make sure of the all switches operation. If the latch head has not pushed the plungers of the monitor switch with door closed, adjust the latch hook position.
   At that time, the latch head should have pushed the plungers of the monitored latch switch and stop switch. If the latch head has pushed the plungers of the monitored latch switch and stop switch with door closed, loose two (2) screws holding latch hook to oven cavity front flange and adjust the latch hook position.

After adjustment, make sure of following:

1. In and out play of door remains less than 0.5 mm when latched position. First check latch hook position, pushing and pulling the door toward the oven face. The results (play of the door) should be less than 0.5mm.
2. The stop switch interrupt the circuit before the door can be opened.
3. When the door is opened the contacts (COM-NC) of the monitor switch and monitored latch switch close. And the contacts (COM-NO) of their switches open.
4. When the door is closed the contacts (COM-NC) of the monitor switch and monitored latch switch open. And the contacts (COM-NO) of their switches close.
5. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

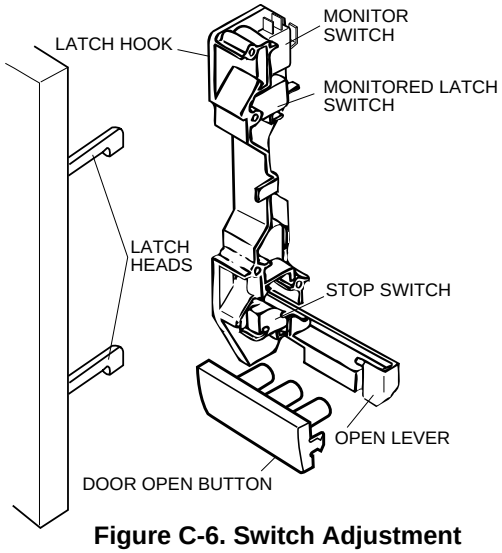


Figure C-6. Switch Adjustment

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

DOOR REPLACEMENT REMOVAL

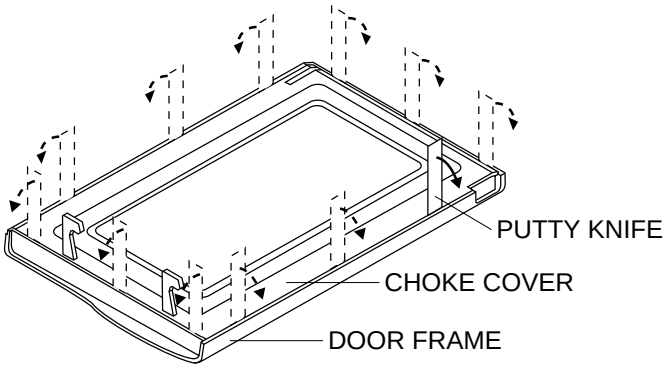


Figure C-5. Door Disassembly

1. CARRY OUT 3D CHECKS.
2. Push the open button and open the door slightly.
3. Insert a putty knife (thickness of about 0.5mm) into the gap between the choke cover and door frame as shown in Figure C-5 to free engaging parts.
4. Release choke cover from door panel.
5. Now choke cover is free.
6. Lift the door upwards.
7. Now, door sub assembly is free from oven cavity.
8. Remove the four (4) screws holding the door panel to the door frame.
9. Release door panel from six (6) tabs of door frame by sliding door panel downward.
10. Now, door panel is free.
11. Slide latch head upward and remove it from door frame with releasing latch spring from door frame and latch head.
12. Now, latch head and latch spring are free.
13. Remove the two (2) screws holding the glass stopper to the door frame.
14. Remove the glass stopper from the door frame.
15. Slide the front door glass leftwards and then slide downwards to release the tabs holding it.
16. Now, the front door glass is free

RE-INSTALL

1. Re-install the front door glass to the door frame as follows. Insert the upper edge of the front door glass into the six (6) tabs of the door frame.

a) Slide the front door glass downwards and insert the lower edge of the front door glass into the six (6) tabs of the door frame.

b) Slide the front door glass rightwards and insert the right edge of the front door glass into the one (1) tab of the door frame.

2. Re-install the glass stopper o the door frame as follows. Re-install the glass stopper to the door frame so that the two (2) holes of the glass stopper meet the two (2) pins of the door frame.

a) Hold the glass stopper to the door frame with the two (2) screws.

3. Re-install the latch spring to the latch head. Re-install the latch spring to the door frame. Re-install latch head to door frame.
4. Re-install door panel to door frame by fitting six (6) tabs of door frame to six (6) holes of door panel.
5. Hold the door panel to the door frame with four (4) screws.
6. Locate door panel hinge pins into cavity hinge location holes.
7. Re-install choke cover to door panel by clipping into position.

Note: After any service to the door;

(A) Make sure that door sensing switch and primary latch switch are operating properly. (Refer to chapter "Test Procedures".).

(B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards. (Refer to Microwave Measurement Procedure.)

After any service, make sure of the following :

1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through centre of latch hole.
2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and does not indicate a leakage of microwave energy from oven cavity.

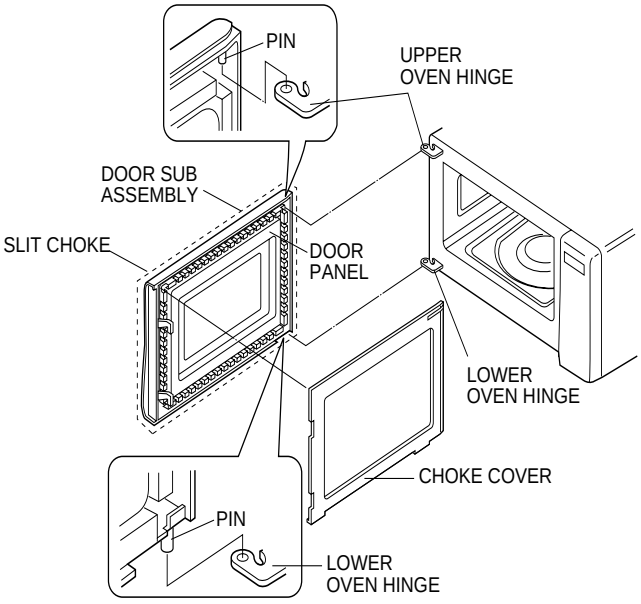


Figure C-6. Door Replacement

NOTE: When carrying out any repair to the door, do not bend or warp the slit choke (tabs on the door panel assembly) to prevent microwave leakage.

MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

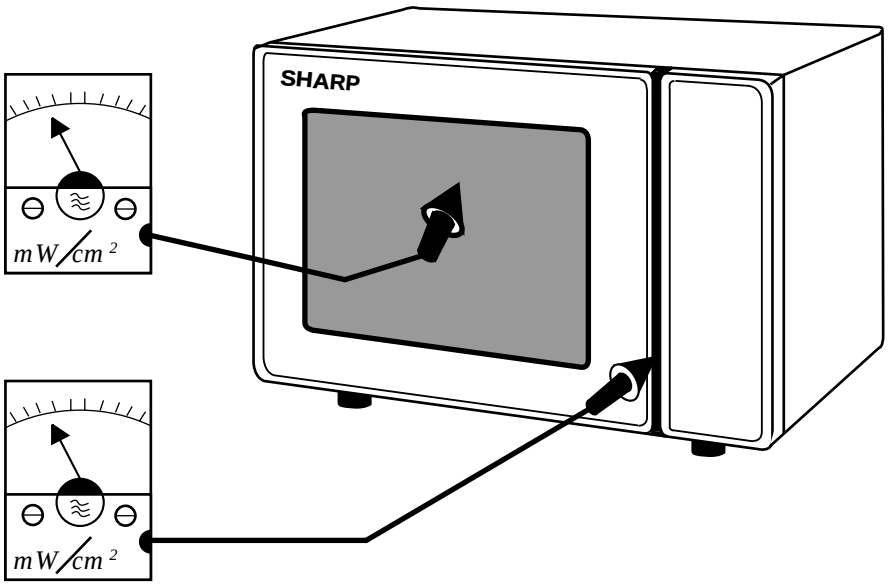
REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of 5mW/cm^2 at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.
   Important:
   Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.
   Recommended instruments are:
   NARDA 8100
   NARDA 8200
   HOLADAY HI 1500
   SIMPSON 380M
2. Place the oven tray into the oven cavity.
3. Place the load of 275 ± 15ml of water initially at 20 ± 5˚C in the centre of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic.
   The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster that 2.5cm/sec.) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

TEST DATA AT A GLANCE

Parts	Symbol	Value / Data
Fuse	F1	20A 250V
Fuse	F2	F8A 250V
Thermal cut-out	TC1	125˚C
Thermal cut-out	TC2	105˚C Off / 130˚C On
Thermistor		Approx. 359.9 kΩ - 152 kΩ at 20˚C - 30˚C
Top grill heating element	GH1	Approx. 56 Ω. Insulation resistance > 10MΩ
Bottom grill heating element	CH2	Approx. 106Ω Insulation resistance > 10MΩ
Oven lamp	OL	240 - 250 V 25W E14
High voltage capacitor	C	1.13μF AC 2100V
Magnetron	MG	Filament < 1Ω Filament - chassis ∞ ohm.
High voltage transformer	T	Filament winding < 1Ω. Secondary winding Approx. 99Ω. Primary winding Approx. 2.4Ω

WARNING: DISCONNECT THE PLUG WHEN MEASURING RESISTANCE.

SCHEMATIC DIAGRAMS

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. PLUGGED IN OVEN.
3. NOTHING APPEARS ON DISPLAY.

Note:
AC CORD CONNECTION
BRN : BROWN
BLU : BLUE
G-Y : GREEN AND YELLOW STRIPE
/15 : SECTIONAL AREA OF 1.5mm² MIN.
"★" Indicates components with potential above 250 V.

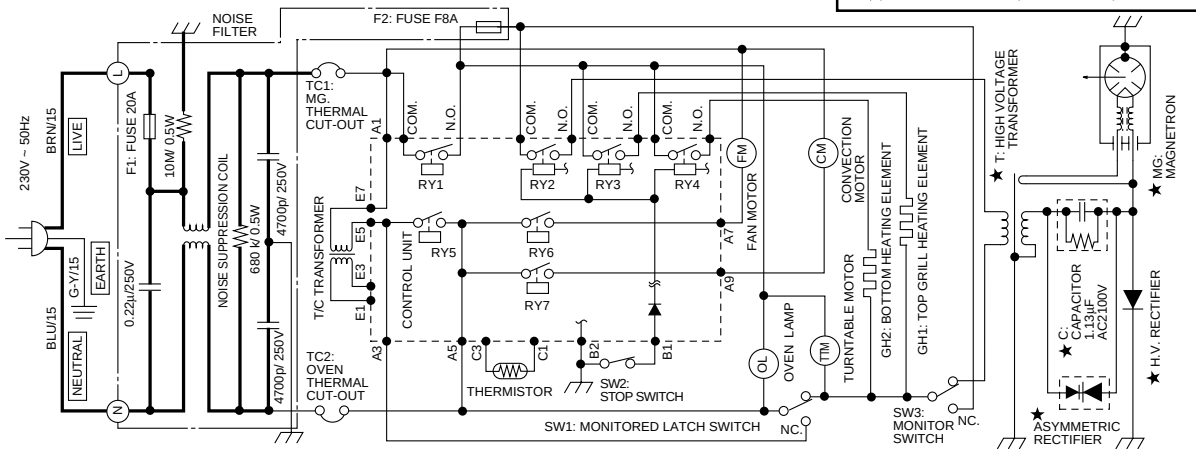


Figure O-1(a) Oven Schematic-OFF Condition right after the oven is plugged in.

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. "ENERGY SAVED MODE" APPEARS ON DISPLAY.

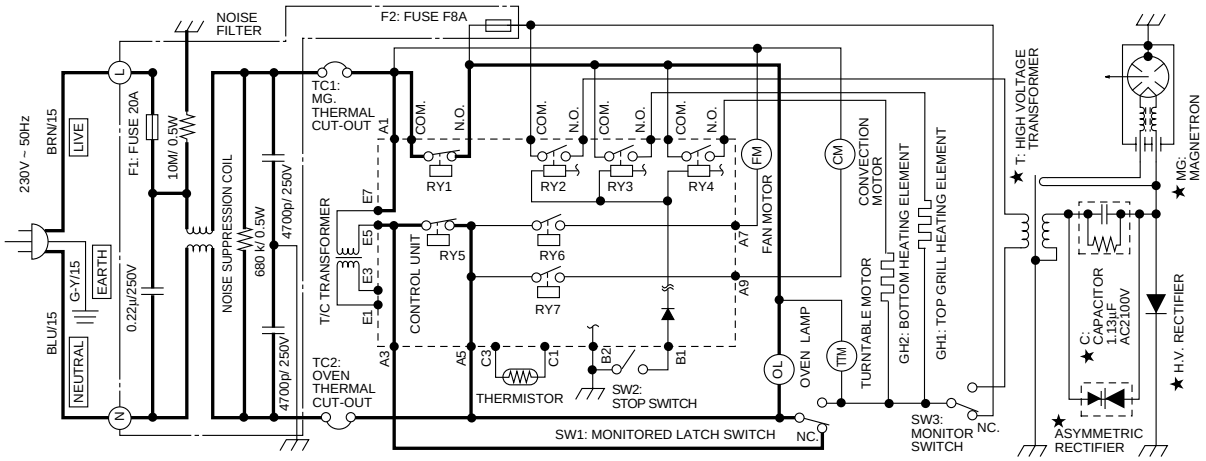


Figure O-1(b) Oven Schematic-OFF Condition when the oven door is opened.

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. " . O" APPEARS ON DISPLAY.

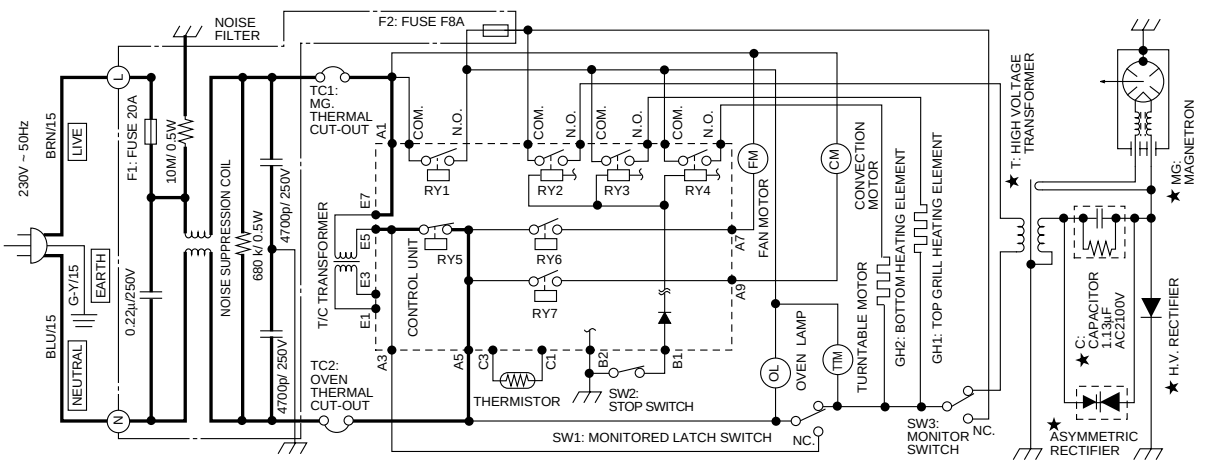


Figure O-1(c) Oven Schematic-OFF Condition after the oven door is closed.

SCHEMATIC DIAGRAMS

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. START KEY TOUCHED.

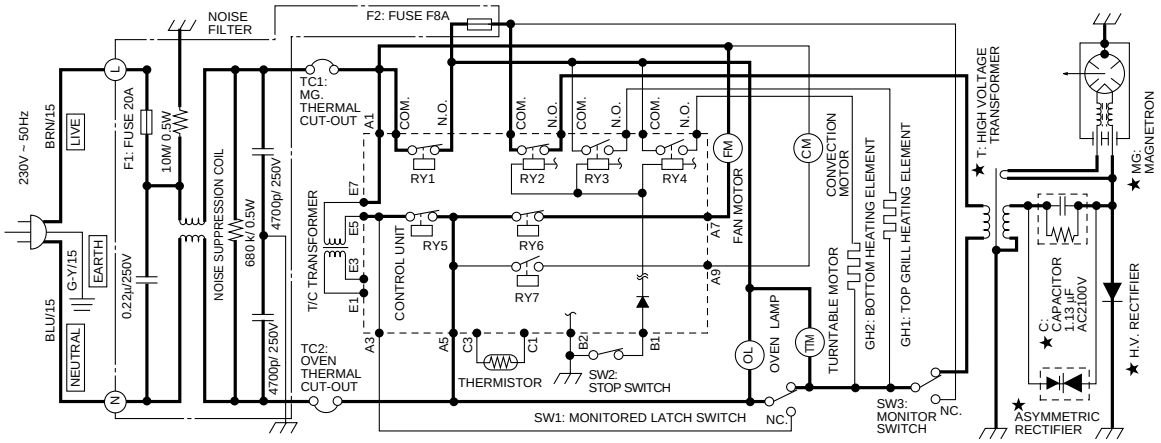


Figure O-2 Oven Schematic-Microwave cooking Condition

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. TOP GRILL MODE SELECTED.
4. START KEY TOUCHED.

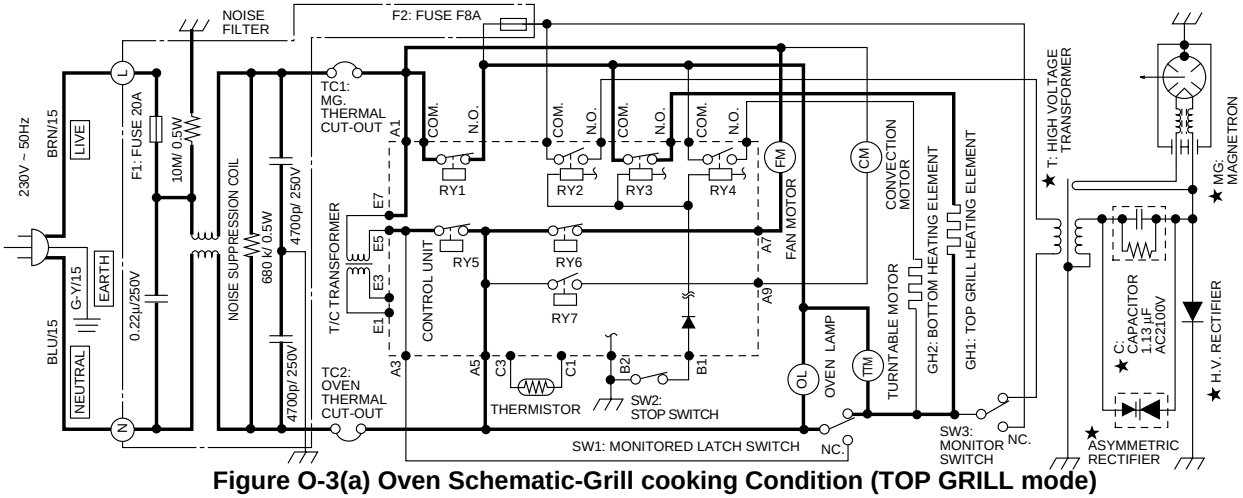


Figure O-3(a) Oven Schematic-Grill cooking Condition (TOP GRILL mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. BOTTOM GRILL MODE SELECTED.
4. START KEY TOUCHED.

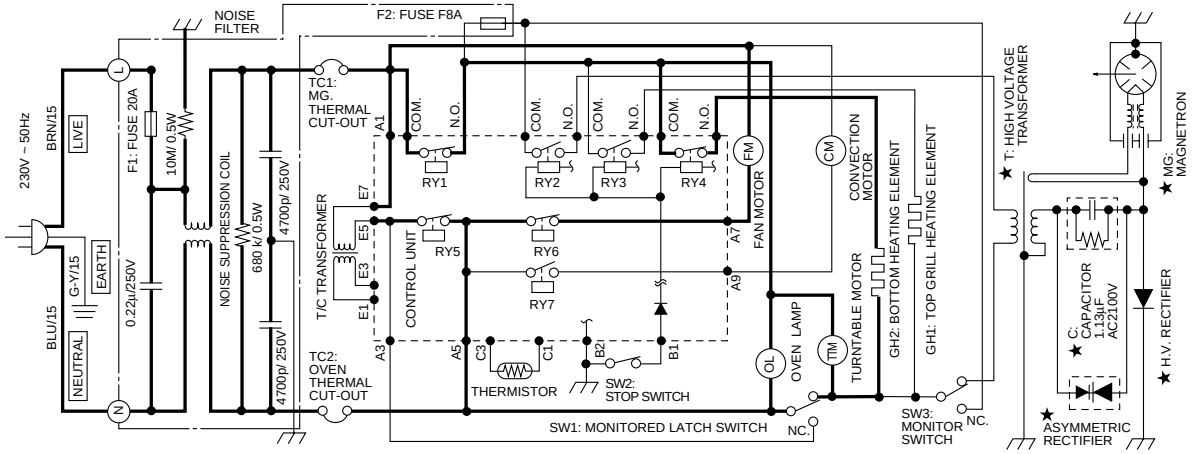


Figure O-3(b) Oven Schematic-Grill cooking Condition (BOTTOM GRILL mode)

SCHEMATIC DIAGRAMS

★ Indicates components with potential above 250 V.

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. TOP & BOTTOM GRILL MODE SELECTED.
4. START KEY TOUCHED.

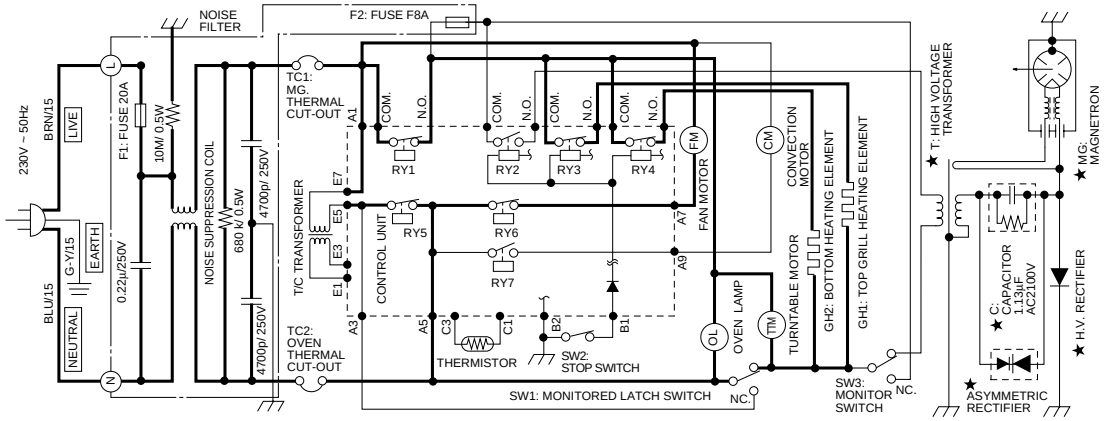


Figure O-3(c) Oven Schematic-Grill cooking Condition (TOP AND BOTTOM GRILL mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. CONVECTION TEMPERATURE SELECTED.
4. START KEY TOUCHED.

NOTE: The top heating element, bottom heating element, fan motor and convection motor will be turned on and off according to the temperature. See "Power setting" on page 9.

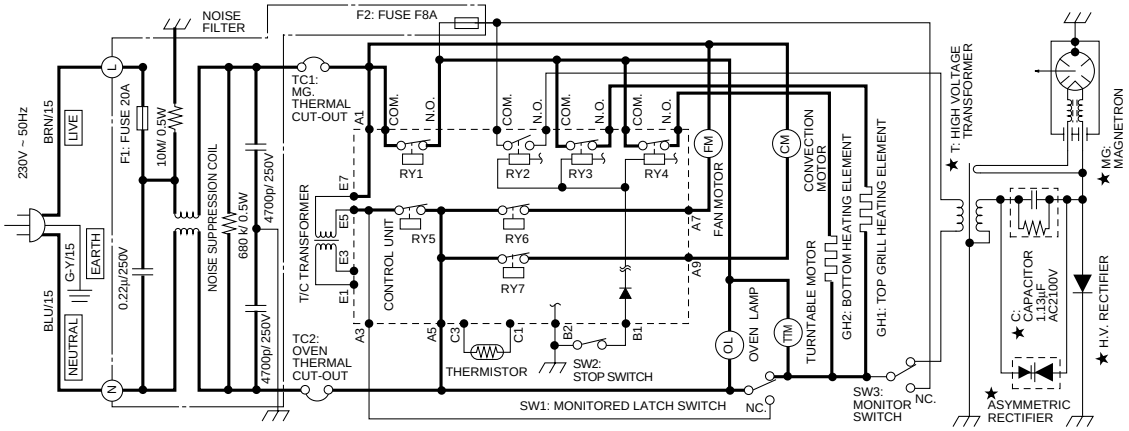


Figure O-4 Oven Schematic-Convection Condition

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. DUAL KEY TOUCHED ONCE.
4. MICROWAVE POWER LEVEL ENTERED.
5. CONVECTION TEMPERATURE SELECTED.
6. START KEY TOUCHED.

NOTE: The top heating element, bottom heating element, magnetron, fan motor and convection motor will be turned on and off according to the temperature or microwave power level. See "Power setting" on page 9.

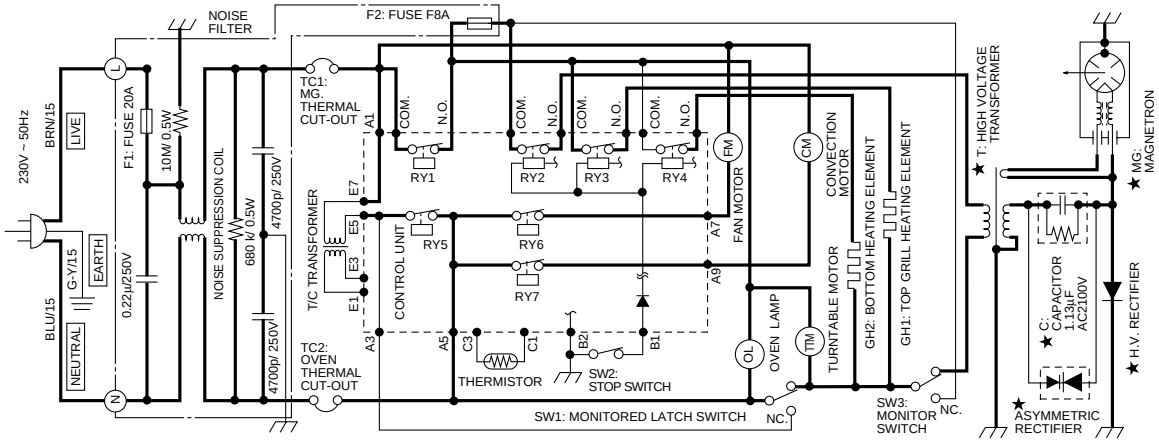


Figure O-5(a) Oven Schematic-Dual cooking Condition (Microwave and Convection mode)

SCHEMATIC DIAGRAMS

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. DUAL KEY TOUCHED TWICE.
4. MICROWAVE POWER LEVEL ENTERED.
5. START KEY TOUCHED.

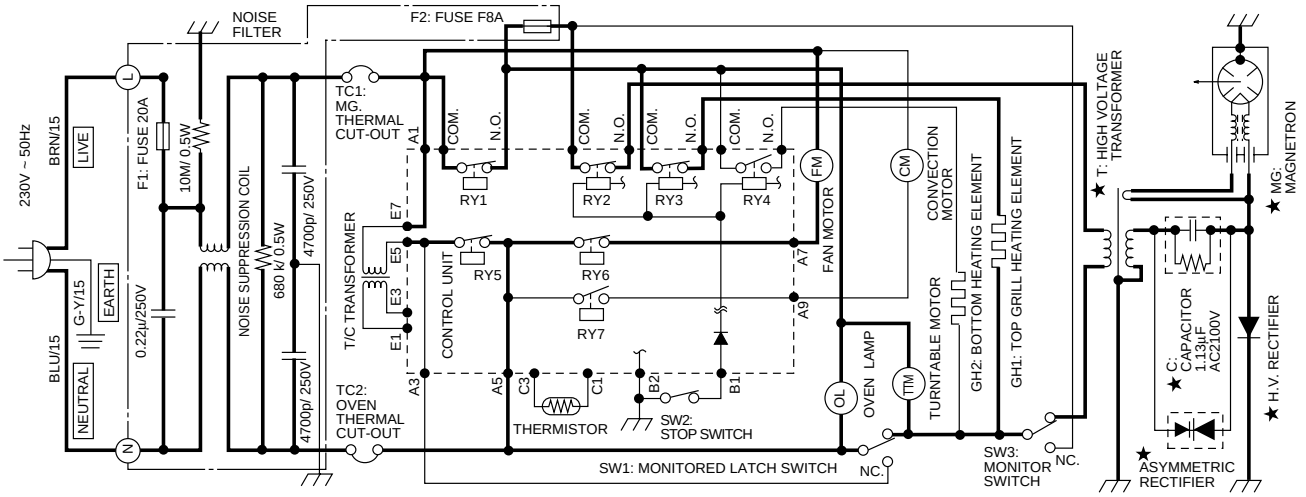


Figure O-5(b) Oven Schematic-Dual cooking Condition (Microwave and Top Grill mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. DUAL KEY TOUCHED THREE TIMES.
4. MICROWAVE POWER LEVEL ENTERED.
5. START KEY TOUCHED.

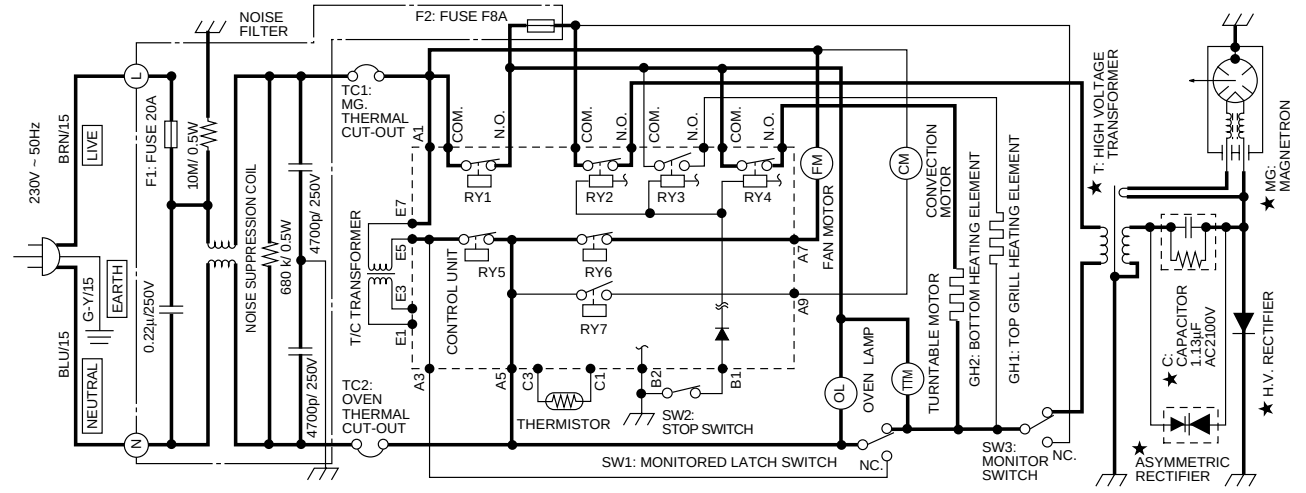


Figure O-5(c) Oven Schematic-Dual cooking Condition (Microwave and Buttom Grill mode)

PICTORIAL DIAGRAM

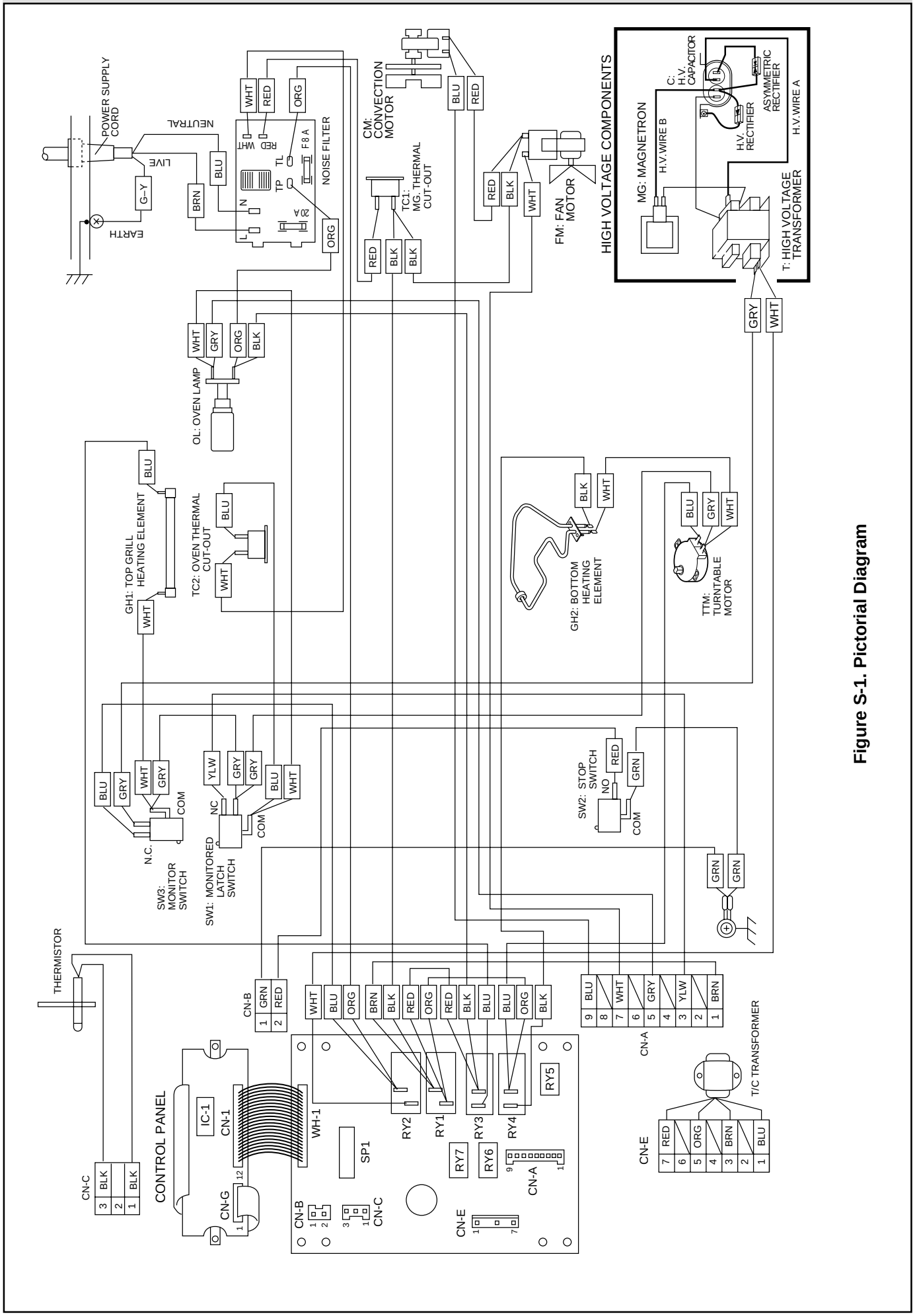
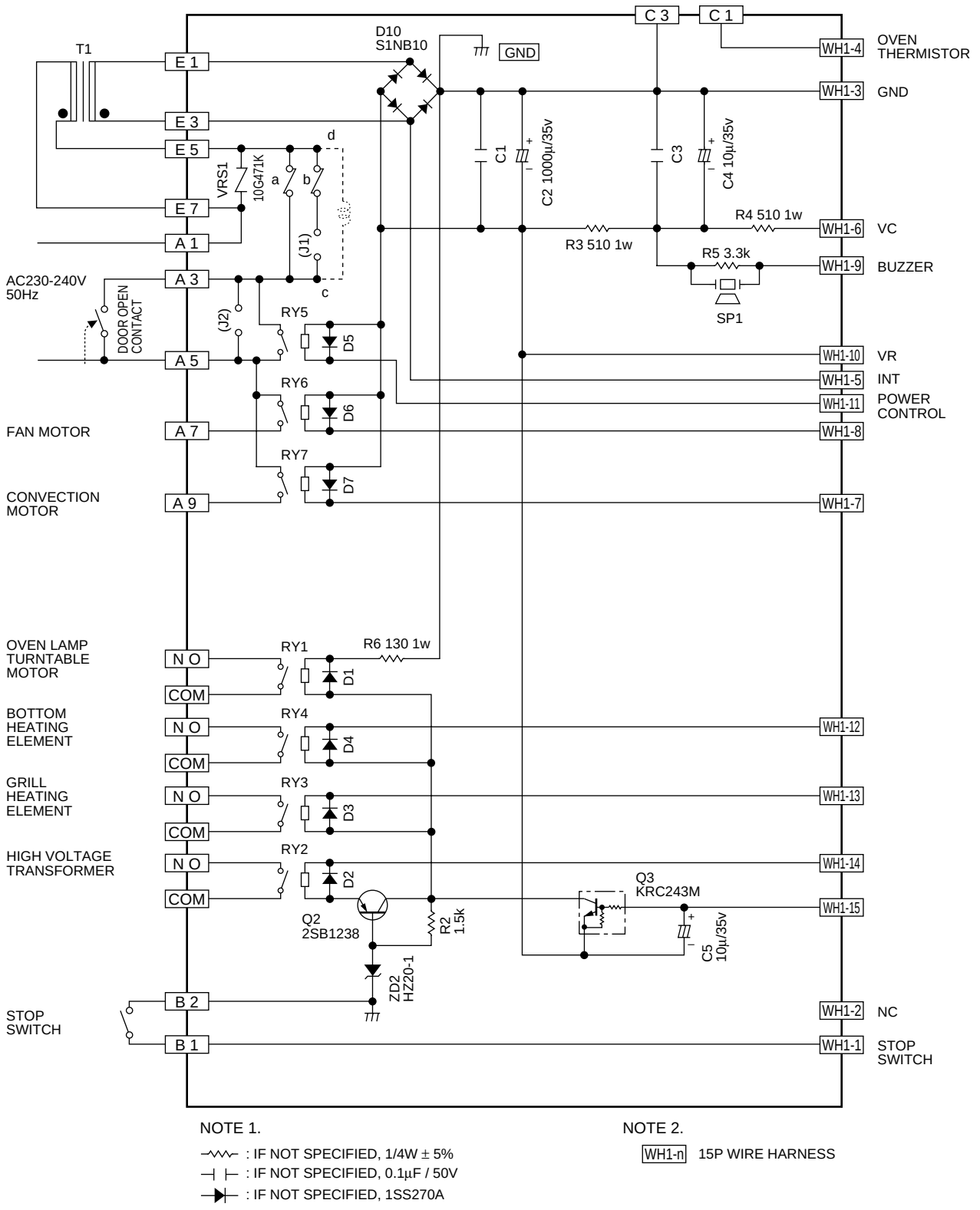


Figure S-1. Pictorial Diagram

POWER UNIT CIRCUIT DIAGRAM



NOTE 1.

: IF NOT SPECIFIED, 1/4W ± 5%

: IF NOT SPECIFIED, 0.1µF / 50V

: IF NOT SPECIFIED, 1SS270A

NOTE 2.

WH1-n 15P WIRE HARNESS

Figure S-2. Power Unit Circuit

CPU UNIT CIRCUIT DIAGRAM

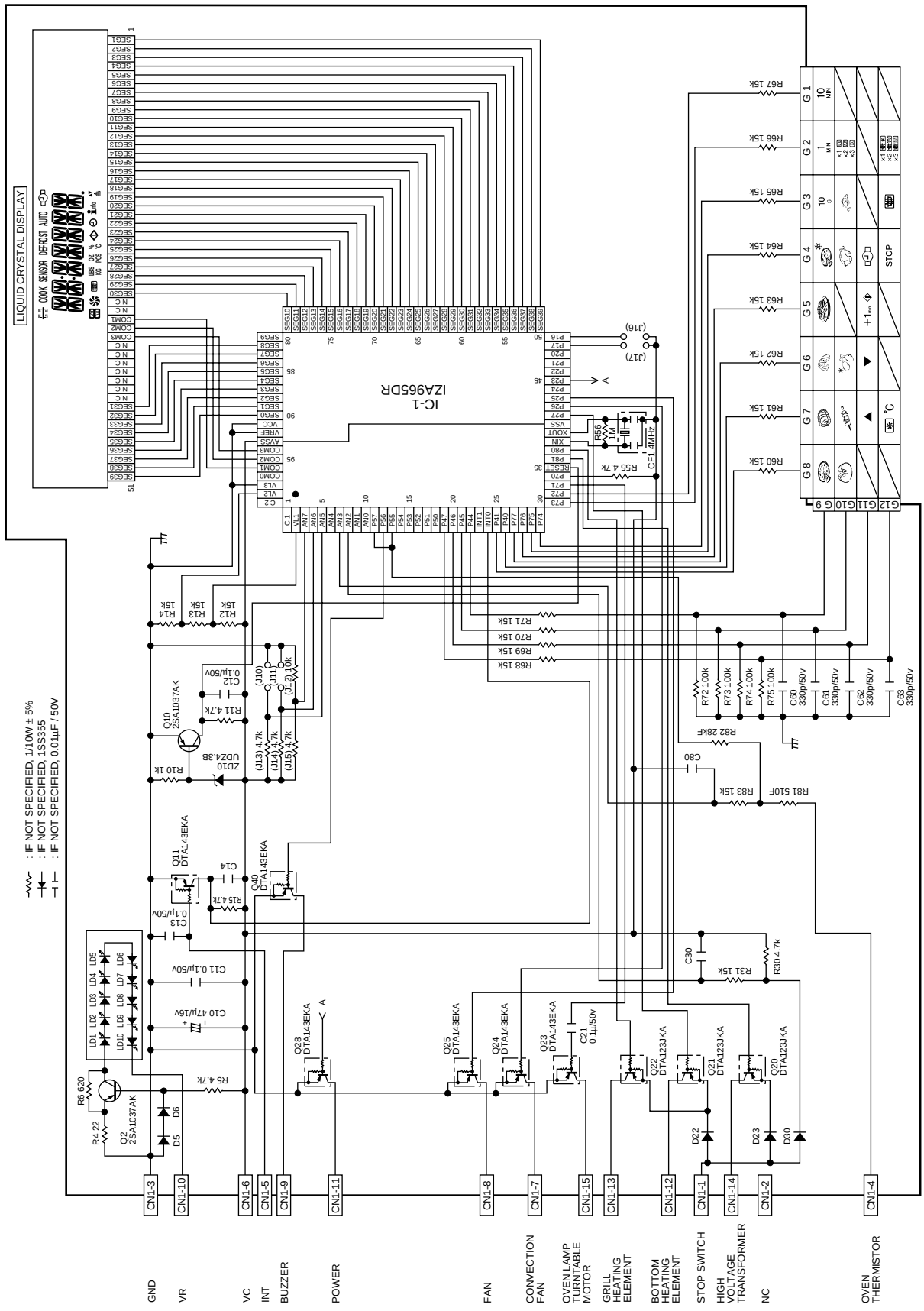


Figure S-3. CPU Unit Circuit

PRINTED WIRING BOARD OF POWER UNIT DIAGRAM

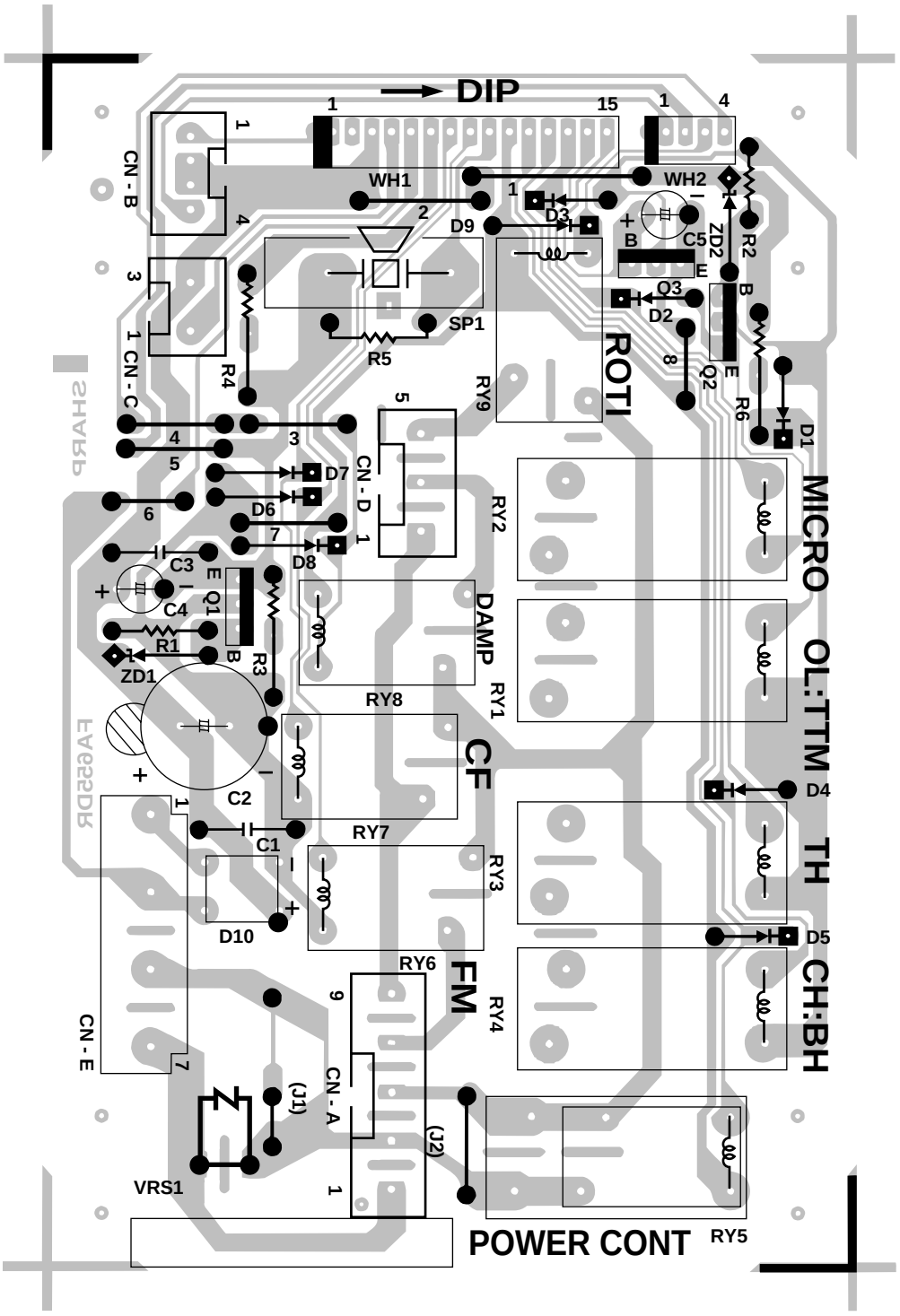


Figure S-4. Printed Wiring Board of Power Unit

PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure. / The parts marked "*" are used in voltage more than 250V. / "§" Mark: Spare parts delivery section

REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE	
ELECTRICAL PARTS						
C	RC-QZA240WRE0	U	High voltage capacitor	1	AR	*
CM	RMOTEA373WRE0	U	Convection motor	1	AV	
F1	QFS-BA009WRE0	U	Fuse 20A	1	AC	
F2	QFS-CA025WRE0	U	Fuse F8A	1	AC	
FM	RMOTEA361WRE0	U	Fan motor	1	AT	
GH1	RHET-A224WRE0	U	Top grill heating element	1	AR	
GH2	RHET-A226WRE0	U	Bottom grill heating element	1	AU	
MG	RV-MZA243WRE1	U	Magnetron	1	BH	*Δ
OL	RLMPTA066WRE0	U	Oven lamp	1	AK	
SW1	QSW-MA146WRE0	U	Monitored latch switch	1	AC	
SW2	QSW-MA147WRE0	U	Stop switch	1	AC	
SW3	QSW-MA146WRE0	U	Monitor switch	1	AC	
T	RTRN-A016URE1	U	High voltage transformer	1	BE	*
TC1	RTHM-A098WRE0	U	Thermal cut-out 125˚C off(MG)	1	AH	
TC2	RTHM-A099WRE0	U	Thermal cut-out 150˚C off 130˚C on (OVEN)	1	AH	
TTM	RMOTDA227WRE0	U	Turntable motor	1	AU	
1- 1	FH-HZA075WRE0	U	Thermistor	1	AN	
1- 2	RTRN-A529WRE0	U	TC transformer	1	AV	
1- 3	QACCVA004URE2	U	Power supply cord	1	AQ	
1- 4	FH-DZA035WRE0	U	High voltage rectifier assembly	1	AP	*
1- 5	FPWBFA309WRE2	U	Noise filter	1	AT	
CABINET PARTS						
2- 1	GCABDA001URP1	U	Back plate	1	AQ	
2- 2	GCABDA002URP0	U	Sub back plate	1	AH	
2- 3	GCABUA469WRT0	U	Outer case cabinet	1	AX	Δ
2- 4	GDAI-A002URP0	U	Base plate	1	AR	
CONTROL PANEL PARTS						
3- 1	DPWBFA172URK0	U	Power unit	1	BB	
3- 1A	QCNCMA453DRE0	U	5-pin connector (CN-A)	1	AC	
3- 1B	QCNCMA414DRE0	U	2-pin connector (CN-B)	1	AB	
3- 1C	QCNCMA410DRE0	U	2-pin connector (CN-C)	1	AB	
3- 1D	QCNCMA230DRE0	U	4-pin connector (CN-E)	1	AC	
3- 1E	QW-QZA008URE0	U	15pin wire harness (WH-1)	1	AG	
C1	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB	
C2	VCEAG31VW108M	U	Capacitor 1000 uF 35V	1	AE	
C3	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB	
C4-5	VCEAG31VW106M	U	Capacitor 10 uF 35V	2	AB	
D1-7	VHD1SS270A/-1	U	Diode (1SS270A)	7	AA	
D10	RSRCDA013DRE0	U	Diode bridge (S1NB10)	1	AE	
Q2	VS2SB1238//-3	U	Transistor (2SB1238)	1	AD	
Q3	VSKRC243M//-3	U	Transistor (KRC243M)	1	AB	
R2	VRD-B12EF152J	U	Resistor 1.5K ohm 1/4W	1	AA	
R3-4	VRS-B13AA511J	U	Resistor 510 ohm 1W	2	AB	
R5	VRD-B12EF332J	U	Resistor 3.3K ohm 1/4W	1	AA	
R6	VRS-B13AA131J	U	Resistor 130 ohm 1W	1	AB	
RY1	RRLY-A117DRE0	U	Relay (DU18D1-1P(M)-R)	1	AG	
RY2	RRLY-A122DRE0	U	Relay (DU18D1-1P(M)-R-S)	1	AG	
RY3-4	RRLY-A113DRE0	U	Relay (DU24D1-1P(M)-R)	2	AG	
RY5-7	RRLY-A080DRE0	U	Relay (OJ-SH-124LM)	3	AG	
SP1	RALM-A014DRE0	U	Buzzer (PKM22EPT)	1	AG	
VRS1	RH-VZA034DRE0	U	Varistor (10G471K)	1	AD	
ZD2	VHEHZ201///-1	U	Zener diode (HZ20-1)	1	AB	
3- 2	DPWBFC149WRKZ	U	CPU unit	1	BC	
3- 3	FUNTKC122URE0	U	Key unit	1	AR	
3- 4	HPNLCR023URF0	U	Control panel frame	1	AL	
3- 5	JBTN-R007URF0	U	Open button	1	AE	
3- 6	MSPRCA045WRE0	U	Open button spring	1	AA	
3- 7	HDECQA002URP0	U	C.P decoration	1	AM	
3- 8	LHLD-A007URF0	U	LED holder	1	AC	
3- 9	PSHEPA647WRE0	U	LED sheet	1	AL	
3- 10	XEPSD30P10XS0	U	Screw : 3mm x 10mm	4	AA	

HOW TO ORDER REPLACEMENT PARTS

To have your order filled promptly and correctly, please furnish the following information.

1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4.DESCRIPTION

PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure. / The parts marked "*" are used in voltage more than 250V. / "§" Mark: Spare parts delivery section

OVEN PARTS

REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
4- 1	DOVN-A017URK0	U	Oven cavity	1	BG
4- 2	LBNDKA107WRP1	U	Capacitor holder	1	AD
4- 3	FDUC-A003URY0	U	Air duct assembly	1	AL
4- 4	LANGQA005URP0	U	Air separate angle B	1	AC
4- 5	PDUC-A636WRP1	U	Air guide duct	1	AM
4- 6	PFILWA001URP0	U	Lamp filter	1	AB
4- 7	PHOK-A078WRF5	U	Latch hook	1	AH
4- 8	LANGQA014URP0	U	Turntable motor angle	1	AE
4- 9	PCUSUA019URE0	U	Cushion	1	AA
4-10	FANGTA003URY0	U	Turntable motor shaft assembly	1	AL
4-12	NFANJA038WRE0	U	Fan blade	1	AF
4-13	PDUC-A637WRF2	U	Fan duct	1	AL
4-14	NFANMA002URP0	U	Cooling fan	1	AF
4-15	GCOVHA001URP1	U	Bottom heater cover	1	AM
4-16	LANGFA155WRP7	U	Chassis support	1	AF
4-17	PPACGA001URE0	U	Heater packing	1	AD
4-18	LANGQA008URP0	U	Grill heater angle	2	AD
4-19	MLEVPA001URF3	U	Open lever	1	AE
4-20	PSPAGA001WRE0	U	Vibration proof cushion	1	AA
4-21	PCUSUA006URE0	U	Air cushion B	1	AA
4-22	PCOVQA002URP0	U	Heater cover	2	AD
4-23	PCOVPA308WRE1	U	Waveguide cover	1	AE
4-27	PDUC-A606WRF1	U	Air intake duct	1	AK
4-28	PDUC-A008URP0	U	Exhaust duct	1	AK
4-29	PSKR-A308WRF0	U	Rear barrier	1	AH
4-31	PCUSUA012URE0	U	Air deflect cushion	1	AB
4-32	LANGQA004URP0	U	Convection air angle	2	AN
4-33	PDUC-A003URP0	U	Convection duct	1	AL
4-34	PFPF-A001URE0	U	Heat intercept	1	AG
4-35	PCOVQA001URP0	U	Rear heat cover	1	AP
4-36	PPIP-A001UR10	U	Pipe	1	AE
4-37	PCUSUA018URE0	U	Back plate cushion	1	AA
4-38	NFANMA001URP0	U	Convection fan	1	AD

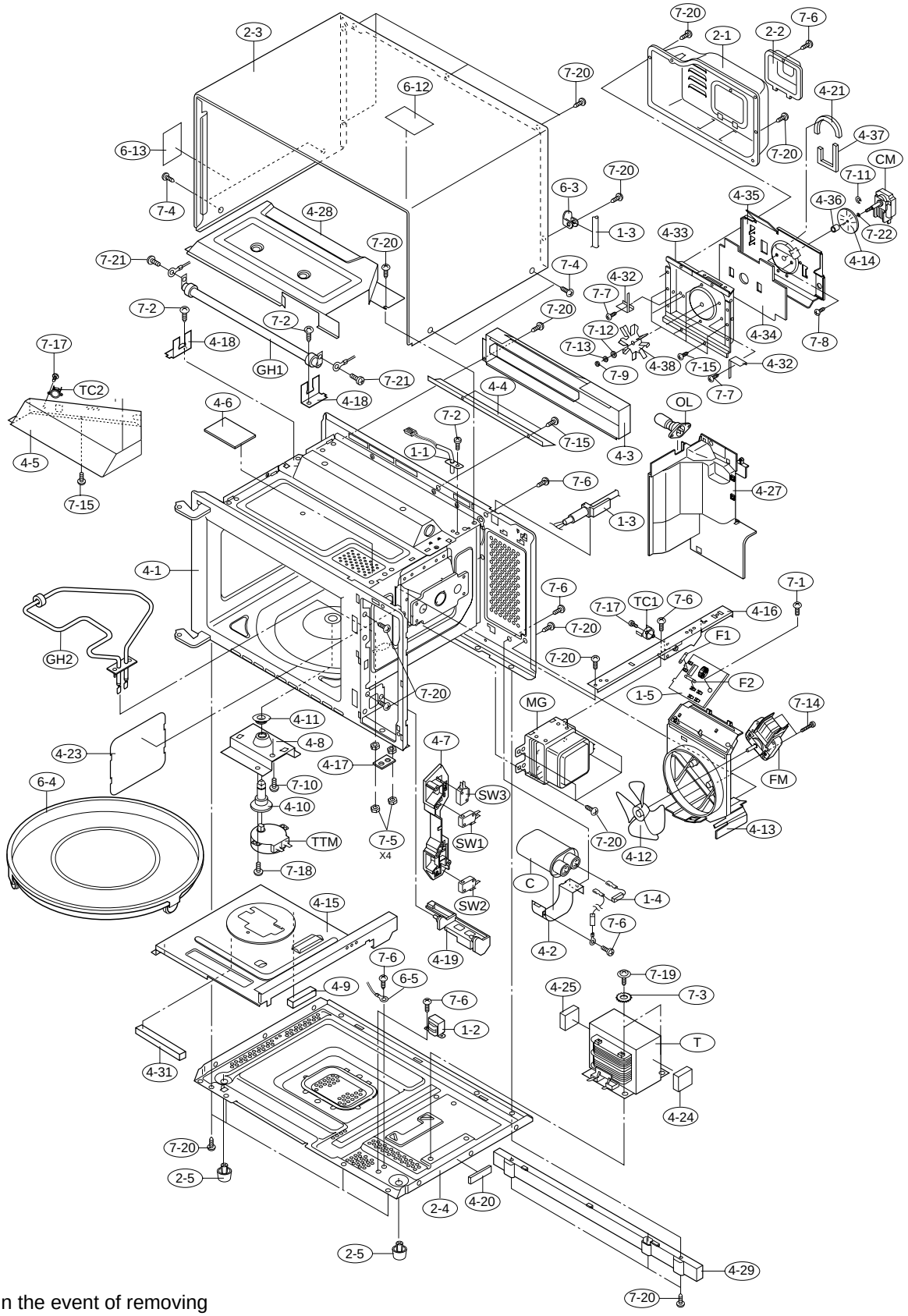
PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure. / The parts marked "*" are used in voltage more than 250V. / "§" Mark: Spare parts delivery section

REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE	
DOOR PARTS						
5- 1	DDORFA766WRK0	U	Door panel assembly	1	BE	Δ
5- 2	GWAKPR005URF0	U	Door frame	1	AT	
5- 3	LSTPPA016URF0	U	Latch head	1	AA	
5- 4	LSTPPA003URF0	U	Glass stopper	1	AB	
5- 5	MSPRTA002URE0	U	Latch spring	1	AA	
5- 6	PGLSPA479WRE1	U	Front door glass	1	AX	
5- 7	XEPSD30P06XS0	U	Screw : 3mm x 6mm	6	AA	
5- 8	GCOVHA365WRF3	U	Choke cover	1	AM	Δ
MISCELLANEOUS						
6- 1	FAMI-A072WRK2	U	High rack	1	AT	
6- 2	FAMI-A095WRK1	U	Low rack	1	AR	
6- 3	LHLDKA008WRF0	U	P-clip	1	AA	
6- 4	CTNT-A002URK0	U	Turntable tray	1	AY	
6- 5	FW-VZA093URE0	U	Stop switch harness	1	AX	
6- 7	QW-QZA210WRE1	U	High voltage wire B	1	AD	*
6- 8	FW-VZA071URE1	U	Main harness	1	AY	
6- 9	TINS-A272URR0	U	Quick start guide	1	AC	
6-10	TINS-A270URR0	U	Operation manual	1	AM	
6-11	TCADCA009URR0	U	Cook book	1	AP	
6-12	TLABMA119URR0	U	Menu label	1	AE	
6-13	TCAUHA006URR0	U	Caution label	1	AE	
SCREWS,NUTS AND WASHERS						
7- 1	XHPSD40P08K00	U	Screw: 4mm x 8mm	1	AA	
7- 2	XOTSD40P10000	J	Screw: 4mm x 10mm	3	AA	
7- 3	XWWSD50-06000	J	Washer: 5mm x 0.6mm	1	AA	
7- 4	XOTSC40P12000	J	Screw: 4mm x 12mm	4	AA	
7- 5	LX-NZ0061WRE0	J	M4 Flange nut	4	AA	
7- 6	XHTSD40P08RV0	J	Screw: 4mm x 8mm	6	AA	
7- 7	XCBWW30P06000	J	Screw: 3mm x 6mm	2	AB	
7- 8	XBPSD40P05000	U	Screw: 4mm x 5mm	2	AA	
7- 9	XNEUW40-32000	J	Nut: 4mm x 3.2mm	1	AA	
7-10	XHPSD40P08000	J	Screw: 4mm x 8mm	1	AA	
7-11	XRESE40-06000	U	Ring	1	AA	
7-12	XWHUW40-08000	U	Washer: 4mm x 0.8mm	1	AA	
7-13	XWSUW40-10000	U	Washer: 4mm x 1.0mm	1	AA	
7-14	XEPSD40P25000	J	Screw: 4mm x 25mm	2	AA	
7-15	XCTWW40P06000	U	Screw: 4mm x 6mm	10	AA	
7-16	LX-EZA045WRE0	J	TTM cover screw	1	AA	
7-17	XCPSD30P06000	J	Screw: 3mm x 6mm	2	AA	
7-18	XFPSD40P08000	U	Screw: 4mm x 8mm	1	AA	
7-19	XFPSD50P10KS0	U	Screw: 5mm x 10mm	2	AB	
7-20	LX-CZA001URE0	J	Screw: 4mm x 12mm	24	AA	
7-21	XBPWW30P05K00	U	Screw: 3mm x 5mm	2	AA	
7-22	XWHUW50-08000	J	Washer: 5mm x 0.8mm	1	AA	
7-23	XOTSD40P12000	J	Screw: 4mm x 12mm	2	AA	

EXPLODED DIAGRAM OF OVEN PARTS

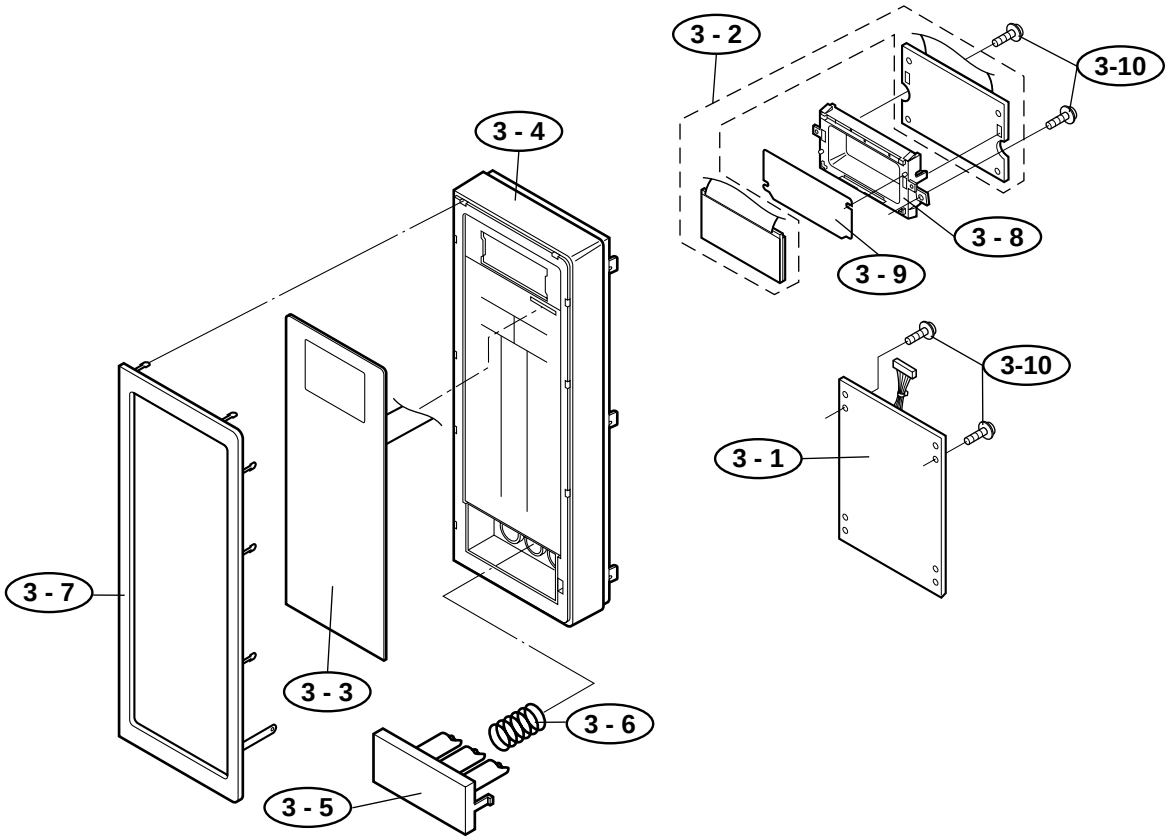
OVEN PARTS



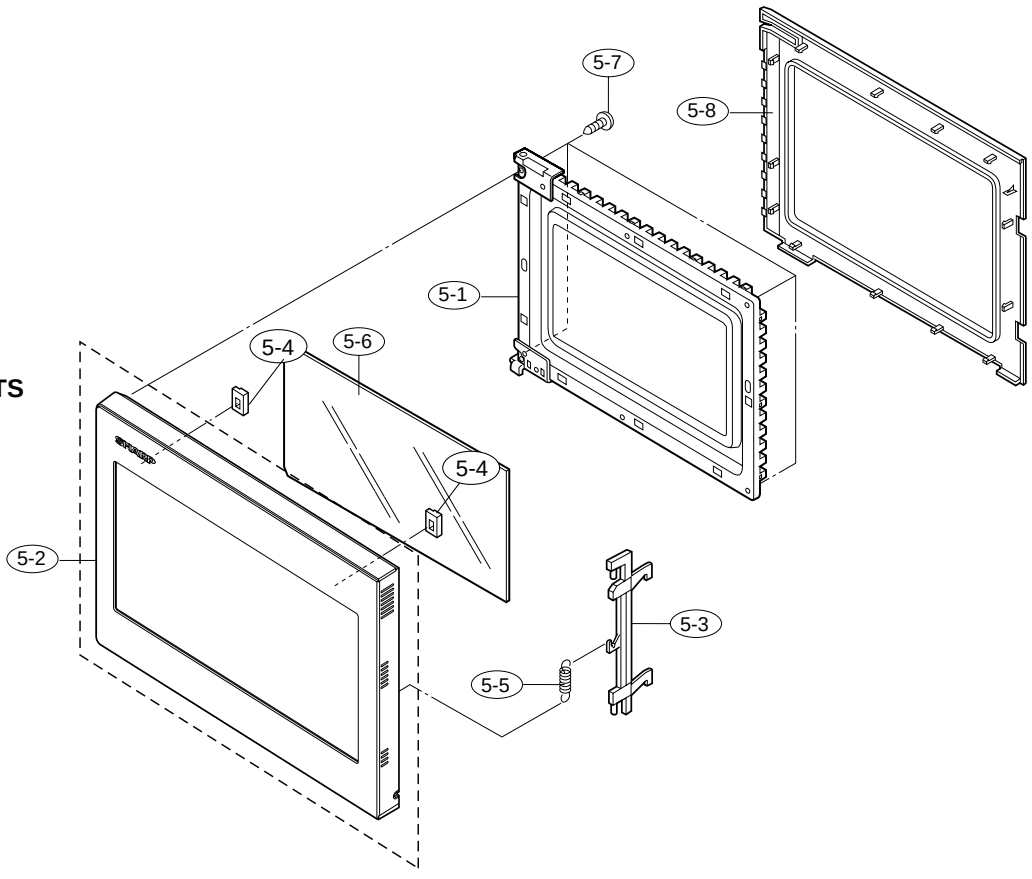
NOTE: In the event of removing the turntable motor cover this part should be refitted using screw connection: LX-EZA045WRE0 (7-16)

CONTROL PANEL PARTS AND DOOR PARTS

CONTROL PANEL PARTS

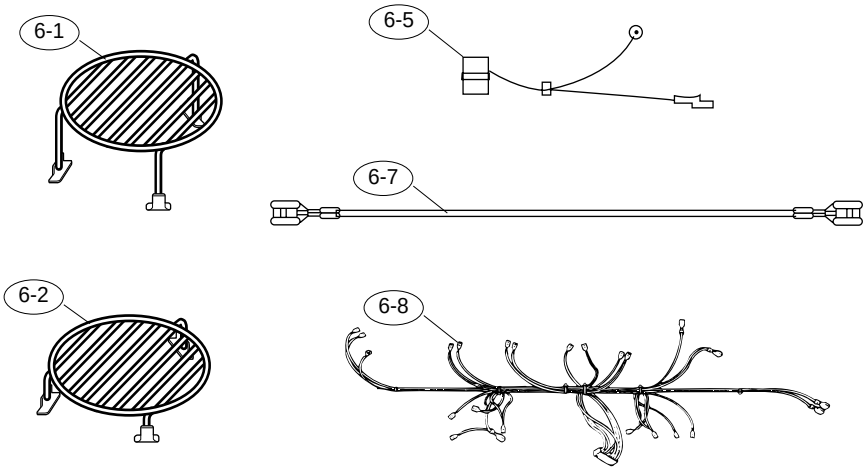


DOOR PARTS



MISCELLANEOUS / PACKING & ACCESSORIES

MISCELLANEOUS



Actual wire harness may be different than illustration.

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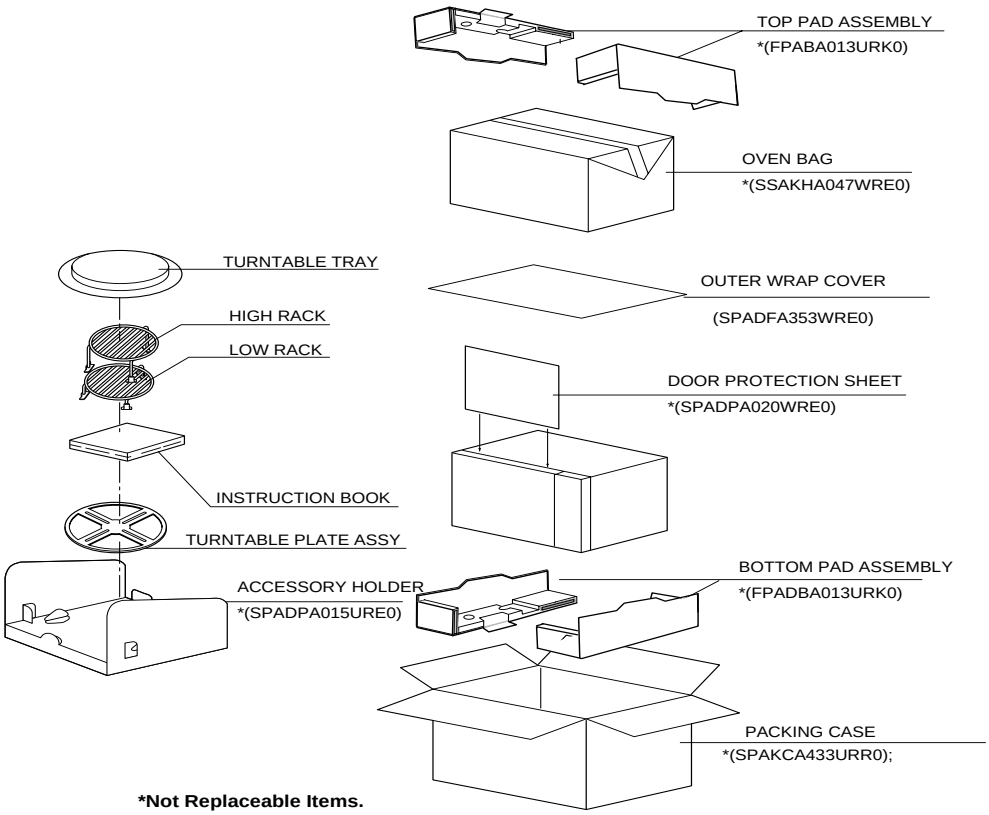
PACKING AND ACCESSORIES



***Not Replaceable Items.**

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